# APPENDIX A

## Administrative Processes

# Appendix A Administrative Processes

# Cost-Share Agreement with the State of California

Reference Section of CVPIA: 3406(h) Start Date: 1993 Status: Ongoing

### Objective

- Enter into a binding cost-share agreement with the State of California to address State responsibilities under CVPIA

### Accomplishment

- Signed a State-Federal Master Cost-Share Agreement on June 27, 1994

### Projects Identified for State Funding

- Shasta Dam Temperature Control Device
- Red Bluff Diversion Dam improvements
- Glenn-Colusa Irrigation District fish screen
- Contra Costa Canal fish screen
- Anadromous Fish Screening Program
- Vernalis Adaptive Management Plan
- Anderson-Cottonwood Irrigation District fish passage
- Central Valley spawning gravel replenishment
- Refuge water supply and facilities
- Clear Creek restoration

Section 3406(h) states, "The Secretary shall enter into a binding cost-share agreement with the State of California with respect to the timely reimbursement of costs allocated to the State in this title. Such agreement shall provide for consideration of the value of direct reimbursements, specific contributions to the Restoration Fund, and water, conveyance capacity, or other contributions in-kind that would supplement existing programs and that would, as determined by the Secretary, materially contribute to attainment of the goals and objectives of this title."

A State-Federal Master Cost-Share Agreement for implementation of the CVPIA was signed by the Regional Directors of Reclamation and the Service and by the Directors of the DWR and DFG on June 27, 1994. The agreement includes provisions describing the term and scope of the agreement, cost-sharing principles, task orders, budgeting, funding, and coordination of 16 restoration actions identified in the agreement and in CVPIA Sections 3406 (b), (d), and (g).

The Cost-Share Agreement establishes a common goal to maximize flexibility to carry out these restoration actions. The agreement was structured so that either party may fund all, none, or any percentage of a specific restoration action in any year, based on available appropriations. The Cost-Share Agreement allows the State to fund its share or provide in-lieu services.

In 1996, State Senator Costa introduced Senate Bill (SB) 900, the "Water Resources and Delta Restoration Act of 1996," as amended. Voters subsequently approved Proposition 204, a bond issue based on SB 900 to provide funds for water projects, facilities, and programs associated with the CVPIA and CALFED processes. SB 900 authorizes $93 million to meet the State's cost-share responsibility for fish, wildlife, and habitat restoration measures required by the CVPIA.

The State identified sections of the CVPIA considered priorities for the bond monies and suggested that this funding be incorporated into a 3 to 5-year budget allocation process. The State and Interior have negotiated task order agreements for seven projects pursuant to the Master Cost-Share Agreement and are negotiating task order agreements for two more projects.

# Restoration Fund

Reference Section of CVPIA: 3407 Start Date: 1993 Status: Ongoing

## Objective

- Provide a funding source for implementing CVPIA habitat restoration, improvement, and acquisition provisions

## Accomplishments

- Established the Restoration Fund in the U.S. Treasury
- Created separate fund codes to identify CVPIA payments, contributions, and charges
- Established interim guidelines for calculation, assessment, and collection of revenues and surcharges
- Collected $171,442,268 in revenues for fiscal years 1993-1998

## Restoration Fund Revenues

| Fiscal Year | Collection |
|---|---|
| 1993 | $8,771,053 |
| 1994 | $20,980,543 |
| 1995 | $33,562,061 |
| 1996 | $46,825,028 |
| 1997 | $36,671,962 |
| 1998 | $24,631,621 |

Section 3407 states, "There is hereby established ... the "Central Valley Project Restoration Fund" (hereafter "Restoration Fund") which shall be available for deposit of donations from any source and revenues provided under sections 3404(c)(3), 3405(f), 3406(c)(1), and 3407(d) of this title. Such sums as are necessary, up to $50,000,000 per year (October 1992 price levels), are authorized...to carry out programs, projects, plans, and habitat restoration, improvement, and acquisition provisions of this title."

In 1992, the Restoration Fund was established in the Treasury of the United States for deposit of revenues associated with the CVPIA. Separate fund codes were established to identify the different sources of payments and contributions received as well as to track expenditures. Total Restoration Fund revenues collected for fiscal years 1993-98 were $171,442,268.

In 1993, interim guidelines were developed that provide instruction on the calculation, assessment, collection, and crediting of payments and charges to be paid by CVP water and power beneficiaries. Rules and regulations are being written for many of the subjects covered by the interim guidelines.

Most CVPIA actions in fiscal years 1993-98 were funded by the Restoration Fund; however, a number were funded (or partly funded) with a combination of Reclamation's Water and Related Resources Appropriation and California State cost-share funding provided under section 3406(h). About 70 percent of the total funds were for actions to benefit anadromous fish.

**FUND ALLOCATION FOR RESTORATION ACTIVITIES**

| Fiscal Year | Restoration Fund | Water and Related Resources Appropriation | State Cost Share |
|---|---|---|---|
| 1993 | 0 | $12,568,000 | 0 |
| 1994 | $11,324,000 | $9,371,000 | 0 |
| 1995 | $26,147,000 | $23,788,000 | 0 |
| 1996 | $40,127,000 | $38,662,000 | 0 |
| 1997 | $62,088,000 | $14,455,000 | 0 |
| 1998 | $31,927,000 | $34,573,000 | $16,125,000 |

**DISTRIBUTION OF FUNDS EXPENDED**

| | |
|---|---|
| Anadromous Fish Restoration | 72 percent |
| Refuges and Waterfowl | 15 percent |
| Other Fish and Wildlife Restoration | 6 percent |
| Fish and Wildlife Studies | 5 percent |
| Monitoring | 2 percent |

The Restoration Fund has an extensive public involvement component, including interaction and coordination with the Restoration Fund Roundtable (a stakeholder organization) and CALFED.

# Rules and Regulations

Reference Section of CVPIA: 3408(a) Start Date: 1993 Status: Ongoing

### Objective

- Establish guidelines and regulations for implementing CVPIA

### Accomplishments

- Developed interim guidelines or criteria for 10 CVPIA sections
- Held public scoping workshops to solicit comments on rulemaking
- Published "Advance Notice of Proposed Rulemaking" and listed CVPIA sections proposed for rulemaking
- Prepared nine Administrative Proposals interpreting the intent of CVPIA to be included in rules and regulations

Section 3408(a) states, "The Secretary is authorized and directed to promulgate such regulations and enter into such agreements as may be necessary to implement the intent, purposes and provisions of this title."

Interior has been conducting a public involvement process to develop rules and regulations for CVPIA implementation. In August and December 1994, Federal Register notices announced public scoping and requested comments on the preliminary list of CVPIA sections designated for rulemaking. Through a series of public workshops, Interior obtained comments on the proposed rules. Interior is currently developing a detailed analysis for each section of CVPIA identified for rulemaking to see whether rulemaking is necessary for those sections. Implementation of each CVPIA section is at a different stage of progress; for example, studies are ongoing on sections such as land retirement and "3406(b)(2) water" (dedication of 800,000 acre-feet of CVP water for fish and wildlife restoration). As a result, rules and regulations are being accomplished in two phases.

The following CVPIA sections were identified for rulemaking:

Phase 1

- 3404(c) - Renewal of Existing Long-Term Contracts
- 3405(a) - Water Transfers
- 3405(b) - Metering of Water Use Required
- 3405(c) - State and Federal Water Quality Standards
- 3405(d) - Water Pricing Reform
- 3405(e) - Water Conservation Standards
- 3407 - Restoration Fund
- 3408(c) - Contracts for Additional Storage and Delivery of Water
- 3408(d) - Use of Project Facilities for Water Banking

Phase 2

- 3406(b)(2) - Fish and Wildlife Restoration, 800,000 acre-feet of CVP yield
- 3406(b)(3) - Fish and Wildlife Restoration, Supplemental Water Acquisition
- 3406(d) - Central Valley Refuges and Wildlife Habitat Areas
- 3408(b) - Use of Electrical Energy (Project Power for Fish and Wildlife)
- 3408(h) - Land Retirement

**INTERIM DOCUMENTS PREPARED PENDING RULES AND REGULATIONS**

**Guidelines were developed for:**

- Interim renewal contracts
- Water transfers
- Restoration Fund payments and charges
- Section 3406(b)(2) water
- Land retirement
- Water conservation cost-share proposals
- Flooding agricultural lands for waterfowl habitat and the CVP yield enhancement and incentive program

**Criteria were developed for:**

- Evaluating water management plans
- Project-use power for CVPIA (Draft)

**CVPIA Administrative Proposals**

| Proposal | Status (date of release) |
|---|---|
| Trinity River | March 20, 1997 |
| Water Conservation | March 20, 1997 |
| Urban Reliability | June 9, 1997 |
| San Joaquin River | June 9, 1997 |
| Stanislaus River | June 23, 1997 |
| 3406 (b)(2) Water | November 20, 1997 |
| Water Transfers | April 16, 1998 |
| Contracting Policies | April 16, 1998 |
| Refuge Water Supplies | April 16, 1998 |
| Restoration Fund | Proposed 2001 |
| AFRP | Addressed through proposal for 3406 (b)(2) |

Between September 1995 and April 1996, Interior held a series of public meetings to identify concerns regarding implementation of the CVPIA. Interior identified twelve major areas of concern. In April 1996, Interior committed to prepare "Administrative Proposals" to address the principal areas of concern about how Interior would implement specific sections of CVPIA.

Nine final Administrative Proposals have been released to the public. The proposal on the Restoration Fund is expected to be released in 2001. The proposals on 3406 (b)(2) and AFRP were combined. The last proposal, dealing with stakeholder involvement, was dropped from further consideration.

Both the initial process to develop interim guidelines and criteria and the Administrative Proposal process are a significant part of the administrative record for promulgation of the rules and regulations. Also important are issues identified during preparation and review of the PEIS. Final rules will be developed following the Record of Decision on the PEIS.

# Programmatic Environmental Impact Statement

Reference Section of CVPIA: 3409 Start Date: 1993 Status: Completed

### Objectives

- Describe the impacts of implementing the CVPIA
- Provide a public forum to exchange information about the CVPIA
- Allow for public input and refinement of alternatives
- Provide information to federal decision makers to allow an informed decision

### Accomplishments

- Completed and released the draft and final PEIS
- Maintained an extensive public involvement process and modified alternatives accordingly

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $3,754,962 |
| 1994 | $3,800,000 |
| 1995 | $7,091,119 |
| 1996 | $6,880,075 |
| 1997 | $4,197,745 |
| 1998 | $1,103,491 |

Section 3409 states, "Not later than three years after the date of enactment of this title, the Secretary shall prepare and complete a programmatic environmental impact statement pursuant to the National Environmental Policy Act analyzing the direct and indirect impacts and benefits of implementing this title, including all fish, wildlife, and habitat restoration actions and the potential renewal of all existing Central Valley Project water contracts."

In coordination with the Service, Reclamation took the lead in developing the Programmatic Environmental Impact Statement (PEIS) for implementing the CVPIA. The Notice of Intent to prepare a PEIS and the notice of scoping meetings were published in the Federal Register (Vol. 58, No. 23) on February 5, 1993. A Plan of Action and Public Involvement Plan were developed in 1993.

Extensive public workshops and briefings were conducted throughout the preparation of the draft PEIS to describe key assumptions, analysis techniques, and results.

In March and April 1993, Interior conducted public scoping sessions to identify the issues, selected a contractor to assist with preparing the PEIS, and prepared cooperating agency agreements with nine governmental entities. These governmental agencies, the "Interagency Group," met at least four times a year during the draft PEIS process to guide the development of the document. Representatives from the Interagency Group also served on work groups that contributed to the preparation of major PEIS work products.

In 1996, the PEIS was updated to include the changes occasioned by the Bay-Delta Accord and subsequent State Water Resources Control Board issuance of a water rights permit to support the Accord. Additionally, the PEIS database was updated to reflect current interpretations of dedicated water described in Section 3406(b)(2), refuge water supply, and estimates of future Trinity River flows. The PEIS team worked with the AFRP team to properly reflect the actions to be taken to make reasonable attempts to double anadromous fish populations in the Central Valley rivers and streams as prescribed by the CVPIA.

The draft PEIS was released in November 1997, and the public comment period closed in April 1998. The PEIS includes 33 technical appendices that describe the major work efforts on the PEIS. Of the 33 appendices, 18 are technical appendices describing specialized resource issues such as surface water; soils and geology; recreation; and fish, wildlife, and recreation economics. A CD-ROM set was developed that contains the PEIS and all technical appendices, as well as the models, input data, and output files that were used in the PEIS. The final PEIS was released in October 1999.

**REPORTS PREPARED FOR SECTION 3409**

- Scoping Report, May 1993
- Various Public Involvement Documents
- Draft PEIS, November 1997
- Final PEIS, October 1999

# APPENDIX B

# Contracting and Improved Water Management

# Appendix B Contracting and Improved Water Management

# Limitation on Contracting and Contract Reform

Reference Section of CVPIA: 3404(a-c) Start Date: 1993 Status: Ongoing

### Objectives

- Restrict new contracts for CVP water, except for fish and wildlife
- Provide for successive interim renewal contracts pending environmental review
- Amend "Friant 14" contracts to comply with existing law
- Encourage early renewal of existing long-term contracts
- Make successive long-term renewal a discretionary action and limit such renewals to 25 years
- Assess and collect all payments and charges from all contractors in accordance with CVPIA

### Accomplishments

- Entered into a new contract to meet water needs of the San Joaquin Valley National Cemetery
- Negotiated and executed 54 3-year interim renewal contracts and subsequent successive 2-year contracts
- Negotiated and executed interim renewal contracts with Friant 14
- Executed 44 of 45 proposed binding agreements providing for early renewal of existing long-term contracts
- Assessed and collected all required payments and charges consistent with the CVPIA and Restoration Fund guidelines

Section 3404 states, "...[T]he Secretary shall not enter into any new short-term, temporary, or long-term contracts or agreements for water supply from the Central Valley Project for any purpose other than fish and wildlife before: (1) the provisions of subsections 3406(b)-(d) of this title are met...The prohibition on execution of new contracts...shall not apply to contracts executed pursuant to...Pub. L. 102-250 or...Pub. L. 101-514 or to one-year contracts for delivery of surplus flood flows or contracts not to exceed two years in length for delivery of class II water in the Friant Unit...The Secretary shall, upon request, renew any existing long-term repayment or water service contract for the delivery of water from the Central Valley Project for a period of 25 years and may renew such contracts for successive periods of up to 25 years each."

Section 3404(c)(3) precludes long-term renewals until completion of required environmental documentation. Pending completion, contract renewals are limited to an initial interim period not to exceed 3 years and successive periods of no more than 2 years. Consistent with these requirements, the Secretary finalized guidelines to address the interim renewal program (1994) and subsequently negotiated and executed 54 initial interim renewal contracts providing for continued water service to 64 contractors. (One contract covers all long-term contracts previously held by 11 contractors.) All 54 interim renewal contracts have been subsequently renewed at least once. The last set of successive interim renewal contracts was completed in February 1998.

Section 3404(c)(1) requires the Secretary to incorporate all modifications necessary to comply with existing law into all CVP contracts renewed since January 1, 1988. The required modifications, which were delayed pending completion of a Federal court appeal related to the subject contracts, were completed in 1998 through negotiation and execution of interim renewal contracts with the "Friant 14." Despite the delay, all CVP water deliveries to the Friant 14 have been assessed restoration payments and Friant surcharges in full accordance with the CVPIA.

Per Section 3404(c)(2), all interim renewal contracts must include provision for payments required by the CVPIA and other modifications to comply with existing law. Consistent with this directive, all existing interim renewal contracts, including the Friant 14, incorporate all legal requirements related to the assessment and collection of restoration payments and Friant surcharges, water metering, State and Federal water quality, water conservation, and repayment and water rate deficits. In addition to these requirements, Reclamation has also included the tiered water pricing provisions of Section 3405(c) in the two long-term water service contracts that have been amended since passage of the CVPIA.

Section 3404(c)(2) requires the Secretary to administer all existing contracts (that is, those that have not been renewed or amended under CVPIA) in conformance with the CVPIA. Such requirements principally focus upon application of various payments and charges. Such rates and charges have been assessed and collected from all contractors subject to existing long-term contracts in full accordance with the CVPIA.

With the exception of the long-term contracts previously held by the Friant 14, Section 3404(c)(3) also requires the Secretary to impose on all contractors having existing long-term contracts an additional mitigation and restoration payment beginning on October 1, 1997, for each acre-foot of delivered CVP water, unless the contractor has previously executed a binding agreement stating the contractor's intent to renew early. In 1997, Reclamation developed and offered a proposed form of binding agreement to each of 41 CVP contractors having a total of 45 existing long-term contracts. The contractors and the United States subsequently executed binding agreements covering 44 of the 45 existing long-term contracts.

Following completion of all required environmental documentation, the Secretary is authorized to enter into long-term renewal contracts having a term of 25 years. The long-term renewal process will cover as many as 112 long-term renewal contracts (68 interim renewal and 44 existing long-term contracts subject to the binding agreement). In preparation for long-term renewals, Interior has: (a) initiated a determination of water needs for each individual contractor, including development of water demand methodologies for irrigation and urban water; (b) completed a series of public scoping meetings; and (c) developed a schedule for all associated activities. The schedule provides for completion of all required activities for most interim renewal and long-term contractors by November 2000.

**REPORTS PREPARED FOR SECTION 3404 (a-c)**

- Interim Contract Renewal Guidelines, 1994
- Environmental Assessments for Interim Contract Renewals

# Water Transfers

Reference Section of CVPIA: 3405(a) Start Date: 1993 Status: Ongoing

### Objective

- Assist water users in meeting future water needs through voluntary transfers of CVP water

### Accomplishments

- Developed Interim Guidelines for implementation of water transfers
- Developed a final Administrative Proposal on water transfers
- Developed and implemented a programmatic approval process to facilitate water transfers
- Approved the transfer of more than 1.5 million acre-feet of CVP water for agricultural and municipal purposes within the CVP and more than 200,000 acre-feet of CVP water to meet Level 4 refuge water supply needs
- Established a formal procedure to coordinate the Service's review of water transfers and ensure compliance with the ESA
- Approved two long-term (25-year) transfers of CVP water

**Approved Water Transfers**

| Fiscal Year | Amount (acre-feet) |
|---|---|
| 1993 | 361,800 |
| 1994 | 158,200 |
| 1995 | 250,200 |
| 1996 | 325,600 |
| 1997 | 346,000 |
| 1998 | 133,400 |

Section 3405(a) states, "In order to assist California urban areas, agricultural water users, and others in meeting their future water needs...all individuals or districts who receive Central Valley Project water under water service or repayment contracts, water rights settlement contracts or exchange contracts entered into prior to or after the date of enactment of this title are authorized to transfer all or a portion of the water subject to such contract to any other California water user or water agency, State or Federal agency, Indian Tribe, or private non-profit organization for project purposes or any purpose recognized as beneficial under applicable State law."

Reclamation finalized Interim Guidelines for implementing the water transfer provisions of CVPIA in February 1993, following public review and comment.

In 1995, Reclamation established a formal procedure with the Service to coordinate the Service's review of water transfers to ensure that conditions necessary for compliance with the Endangered Species Act would be met under each transfer action.

In 1996, Interior developed an Administrative Proposal on water transfers to address public concerns on Interior's implementation of the CVPIA water transfer provisions. Interior's final Administrative Proposal on water transfers was completed in April 1998. The Interim Guidelines and the Administrative Proposal provide information to CVP water contractors and interested parties on how Reclamation will consider water transfer proposals pending final rules and regulations.

In addition, Reclamation developed a programmatic review and approval process to facilitate the approval of those water transfers within the CVP that had historically occurred between contractors within the same service area. This review streamlined the transfer approval process and resolved issues raised by CVP contractors that the transfer provisions were cumbersome and an impediment to meeting short-term water management goals.

Active markets have developed for short-term transfers of CVP water (periods of 1 year or less). Since enactment of the CVPIA, more than 1.5 million acre-feet of CVP water has been transferred by contractors within the various divisions of the CVP both north and south of the Delta. The majority of these transfers were accomplished for agricultural uses under the CVPIA programmatic review and approval process. More than 200,000 acre-feet of water has also been transferred by CVP contractors to Interior's Water Acquisition Program to meet Level 4 refuge water supply needs within the Central Valley.

To date, two long-term (25-year) transfers have been approved. One involves the transfer of 22 acre-feet of water to a non-CVP customer for municipal and industrial (M&I) uses and is subject to the required

additional M&I restoration surcharge and the M&I cost-of-service rate. The second long-term transfer involves the transfer of up to 25,000 acre-feet of water between CVP contractors for agricultural purposes. To date, no transfers involving the CVP water outside the CVP service area have occurred.

**REPORTS PREPARED FOR SECTION 3405(a)**

- Interim Guidelines for Water Transfers, 1993
- Final Administrative Proposal on Water Transfers, 1998

# Water Conservation

Reference Section of CVPIA: 3405(b) and (e) Start Date: 1993 Status: Ongoing

### Objectives

- Establish a water conservation center
- Develop criteria to evaluate water management plans
- Review and evaluate new and revised water management plans
- Make sure districts use water measuring devices

### Accomplishments

- Established a Water Conservation and Advisory Center and constructed the American River Water Education Center
- Developed criteria for evaluating water management plans in 1993 and 1996
- Deemed more than 70 water management plans adequate
- Developed a water conservation database to track plan implementation
- Developed a final Administrative Proposal on water conservation
- Provided cost-share and technical assistance to implement best management practices

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | 0 |
| 1994 | $32,474 |
| 1995 | $17,553 |
| 1996 | $777 |
| 1997 | $1,773 |
| 1998 | $4,385 |

Section 3405(e) states, "The Secretary shall establish and administer an office on Central Valley Project water conservation best management practices,...develop criteria for evaluating the adequacy of all water conservation plans developed by project contractors, including those plans required by section 210 of the Reclamation Reform Act of 1982. Criteria... shall be established within six months following enactment of this title and shall be reviewed periodically thereafter, but no less than every three years..."

A Water Conservation and Advisory Center was opened in early 1993 at Reclamation's Mid-Pacific Regional Office in Sacramento and later was relocated to Reclamation's Central California Area Office in Folsom. The American River Water Education Center, which incorporates the original Center, was constructed at Folsom Dam and opened in 1999. A virtual water conservation center was established on the Internet at: www.watershare.usbr.gov. It features interactive water conservation units on the environment, urban conservation, and agriculture targeting students and providing teacher lesson plans.

Reclamation released "Criteria for Evaluating Water Conservation Plans" in April 1993 and revised the document in September 1996. This revised document describes the criteria Reclamation follows in evaluating water management plans submitted by water and irrigation districts. Reclamation has deemed more than 70 water management plans adequate under the CVPIA.

The water management plans also require contractors to address water measurement. Section 3405(b) states, "...the contracting district or agency shall ensure that all surface water delivery systems within its boundaries are equipped with water measuring devices or water measuring methods of comparable effectiveness acceptable to the Secretary..." The evaluation criteria establish measurement to the customer by devices with accuracy of plus or minus 6 percent.

To support water conservation efforts, Reclamation developed a database with examples of successful water conservation programs to enable districts to prepare their annual water management plan update. A guidebook and training were offered to districts in both the urban and agricultural sectors. Technical assistance to implement plan measures was provided to districts through California Polytechnic State University's Irrigation Training and Research Center and through the Water Conservation Field Services Program and Efficiency Incentives Program.

Water conservation was an area of concern identified during the CVPIA Administrative Proposal process. A final Administrative Proposal on water conservation was released in March 1997.

# Water Conservation Projects

Reference Section of CVPIA: 3408(i) Start Date: 1994 Status: Concluded

### Objective

- Establish cost-sharing agreements with CVP contractors to implement water conservation projects

### Accomplishments

- Developed guidelines to administer the cost-sharing program
- Solicited proposals for water conservation projects in 1995, 1996, and 1997

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $32,474 |
| 1995 | $17,553 |
| 1996 | $777 |
| 1997 | $1,773 |

Section 3408(i) states, "The Secretary is authorized to undertake, in cooperation with Central Valley Project irrigation contractors, water conservation projects or measures needed to meet the requirements of this title." All projects or measures must be fully implemented by September 30, 1999. The water conserved under this cost-sharing program can be used to achieve the restoration goals of the CVPIA and provide additional benefits for fish, wildlife, and associated habitats in the Central Valley.

In 1995, Reclamation's Water Conservation Office developed guidelines for administering this section of the CVPIA and established criteria to assess water conservation proposals submitted by CVP contractors.

Interior issued four requests for cost-sharing proposals between November 1995 and September 1997. In response, Tulare Irrigation District submitted a preliminary proposal in 1996, and Chowchilla Water District submitted one in 1997. Each district submitted information so Reclamation could determine whether the proposed projects would meet the minimum eligibility requirements under the guidelines.

The preliminary proposal submitted by the Tulare Irrigation District was accepted; however, the District chose not to follow up with a complete proposal. The preliminary proposal from the Chowchilla Water District was determined to be economically infeasible; therefore, Chowchilla did not submit a complete proposal.

The program was concluded on November 30, 1997, because no viable proposals had been received in response to the four proposal solicitations and so few CVP contractors had expressed interest in participating. Further, there was insufficient time to solicit and evaluate an additional round of proposals before the program was scheduled to sunset in 1999. The main reason for the limited response to this program was that districts found it to be more profitable to finance water conservation projects on their own and then provide the conserved water to their customers or sell the water on the open market.

# APPENDIX C

# Anadromous Fish - Habitat Restoration

# Appendix C Anadromous Fish - Habitat Restoration

# Anadromous Fish Restoration Program

Reference Section of CVPIA: 3406(b)(1) Start Date: 1993 Status: Ongoing

## Objectives

- Improve habitat for all life stages of anadromous fish by providing flows of suitable quality, quantity, and timing
- Reduce or eliminate entrainment of juveniles at diversions
- Improve the opportunity for adult fish to reach their spawning habitats
- Collect fish population, health, and habitat data to help evaluate restoration actions
- Integrate habitat restoration efforts with harvest and hatchery management
- Involve partners in the implementation and evaluation of restoration actions

## Accomplishments

- Established the AFRP Core Group to guide implemention of anadromous fish-related sections of CVPIA
- Released Revised Draft Restoration Plan for the Anadromous Fish Restoration Program, 1997
- Conducted an extensive public involvement and education process and coordinated participation in anadromous fish technical workshops
- Initiated restoration of instream habitats within 30 miles of valley river and stream corridors
- Acquired or restored nearly 4,300 acres of riparian habitat adjacent to Central Valley rivers and streams

Section 3406(b)(1) states, "The Secretary... is authorized and directed to...develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991." The section also states, "this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool."

The Service and Reclamation approached implementing the directive to "at least double natural production of anadromous fish" by developing the Anadromous Fish Restoration Program (AFRP). AFRP is the cornerstone of many actions aimed at restoring natural production of anadromous fish in the Central Valley and includes partnerships, local involvement, public support, adaptive management, and flexibility. Early in the AFRP process, a Core Group was formed to direct program development. This group comprised a coalition of senior fish experts from the Service, Reclamation, Environmental Protection Agency, National Marine Fisheries Service, and California's Departments of Fish and Game, and Water Resources.

**Goals of the Anadromous Fish Restoration Program**

- Determine the quantity, quality, and timing of flows necessary to protect anadromous fish
- Provide a framework for the management of CVP water dedicated to anadromous fish
- Recommend structural habitat restoration measures
- Guide the acquisition and management of supplemental water needed to meet the biological goals of the CVPIA

To plan and implement a comprehensive program, the AFRP requires ongoing, intensive public involvement at two levels. The first level is programmatic, involving efforts to plan a comprehensive program. The second level is action-specific and involves implementing specific actions in individual watersheds. At the action-specific level, the AFRP worked with local agencies and local watershed workgroups.

After public review and revision, Interior released a Revised Draft Restoration Plan for the AFRP in June 1997. The Restoration Plan presented the overall goal, objectives, and strategies of the AFRP and identified and prioritized nearly 300 restoration actions and evaluations. The Restoration Plan is a programmatic-level guide to implementation of all applicable sections of the CVPIA. A detailed implementation plan will be completed later. This plan will be an evolving document, amended over time as additional information is gathered, partnerships are formed, and actions are implemented.

## Accomplishments

- Provided criteria for application of water dedicated under Section 3406(b)(2)
- Participated in acquisition of nearly 315,000 acre-feet of water for instream uses on Central Valley tributaries
- Participated in numerous watershed planning groups
- Completed a Handbook of Regulatory Compliance for AFRP restoration planning
- Decreased fine sediment input into the stream channel through erosion control activities

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $0 |
| 1994 | $338,581 |
| 1995 | $791,722 |
| 1996 | $4,129,927 |
| 1997 | $11,151,633 |
| 1998 | $6,545,050 |

Interior's anadromous fish restoration actions, although broad in scope and complexity, focused on four geographic areas from 1993 to 1998:

- **Sacramento-San Joaquin Delta** - Emphasis on offsetting effects of CVP and SWP export facilities (entrainment, impingement, diversion, and increased predation).
- **Sacramento River Tributaries** - Actions focused on riparian and shaded riverine aquatic habitat restoration, primarily on tributaries; improved access to upstream habitat; and reduction of losses at diversions, especially for spring – run chinook salmon and steelhead.
- **Sacramento River** - Actions focused on restoration of spawning habitat and acquisition of riparian lands to improve rearing habitat, especially for winter-run chinook salmon.
- **San Joaquin River and Tributaries** - Actions focused on restoration of river channels, spawning gravels, and riparian cover and on elimination of predator habitat on tributaries.

Restoration actions were selected and prioritized based on the expected magnitude of their contributions to doubling natural production, the status of target species and races, and on section 3406(b)(1)(A), which directs Interior to give first priority to: (1) measures which protect and restore natural channel and riparian habitat values through habitat restoration actions, (2) modifications to CVP operations, and (3) implementation of the supporting measures mandated by Subsection 3406(b).

To allow for adaptive management of anadromous fish restoration, a major effort was initiated to determine the needs of anadromous fish and associated impacts of implementing the CVPIA. Using existing information and data gathered from associated studies and investigations, the AFRP was able to guide or provide an immense array of restoration actions from 1993-98. Through coordination and partnership with State and Federal agencies and private interests representing agriculture, urban, and industrial interests, numerous restoration activities were accomplished.

**Sacramento-San Joaquin Delta**

- Provided management conditions and flow targets for Delta application of water dedicated under Section 3406(b)(2).
- Assisted other CVPIA efforts at the Tracy Pumping Plant, Contra Costa Canal Pumping Plant, Delta Cross Channel and Georgiana Slough, and in efforts to screen diversions in Suisun Bay.

**Sacramento River Tributaries**

- Provided flow-related objectives for application of water dedicated under Section 3406(b)(2).
- Partnered with local watershed workgroups on Mill, Deer, and Butte Creeks, with the American River Watershed Forum, Sacramento National Wildlife Refuge Complex, and Senate Bill 1086 process to restore the Sacramento River meander belt.
- Participated in acquisition of nearly 30,000 acre-feet of water supplies for instream flows on Battle Creek, 1995-97.
- Provided for acquisition and restoration of over 4,000 acres of riparian habitat.
- Provided for installation of fish screens and ladders at Durham Mutual and Parrott-Phelan Dams on Butte Creek.
- Provided for development of managed fish passage above Coleman National Fish Hatchery on Battle Creek.
- Partnered with Corps of Engineers to evaluate passage at Daguerre Point Dam on the Yuba River.

**Sacramento River**

- Provided flow-related objectives for application of water dedicated under Section 3406(b)(2) on the Sacramento River annually.
- Initiated and/or completed many studies assisting in the continued survival of winter-run chinook salmon.
- Provided for acquisition and restoration of 750 acres of riparian habitat.

**San Joaquin River and Tributaries**

- Provided basin-specific flow-related objectives for application of water dedicated under Section 3406(b)(2).
- Partnered with Lower Tuolumne River Technical Advisory Committee on watershed improvement projects.
- Participated in acquisition of over 280,000 acre-feet of water supplies in the basin, 1994-98.
- Provided for acquisition and/or restoration of over 240 acres of riparian habitat.
- Initiated elimination of predator habitat on the Tuolumne River.

The AFRP was also used to help develop guidelines and objectives for use of water management tools provided by the CVPIA. These guidelines and objectives were used in developing alternatives for the Programmatic EIS for the CVPIA, and continue to form the basis for discussion among various parties interested in Interior's efforts to develop a long-term water management plan.

Combined with other actions under CVPIA, it is expected that these actions will stabilize populations of spring-run chinook salmon at an enhanced level on tributary streams they currently use and allow the identification of areas for expansion of habitat for this species. Similarly, improved spawning and rearing habitat, the elimination of predator habitat, and improved outmigration conditions will help increase and stabilize populations of San Joaquin River fall-run chinook salmon. Natural population of steelhead, fall-run chinook salmon, and late fall-run chinook salmon should begin to increase dramatically on Battle Creek, and all species should benefit from actions on the Sacramento River mainstem. These actions will not only enhance natural production of target species but will benefit other species of fish (both resident and other anadromous species) and riparian-oriented wildlife.

**REPORT PREPARED FOR SECTION 3406(b)(1)**

- Draft Anadromous Fish Restoration Plan, 1997

# Management of Dedicated CVP Yield

Reference Section of CVPIA: 3406(b)(2) Start Date: 1993 Status: Ongoing

### Objectives

- Provide instream flows for fish, wildlife, and habitat restoration
- Assist State efforts to protect the Bay/Delta estuary
- Help meet additional obligations as may be legally imposed on the CVP
- Increase integrated ecological management of all Central Valley fish and wildlife and their habitat

### Accomplishments

- Provided water to implement flow and habitat objectives for CVP rivers and the Delta
- Provided water to help meet the Biological Opinions for winter-run chinook salmon and Delta smelt
- Provided water for CVP share of the Delta Accord, 1994-98
- Coordinated interim management of the dedicated water annually since 1993
- Prepared the final CVPIA Administrative Proposal, 1997
- Initiated updates of the Operational Criteria and Plan to reflect AFRP implementation
- Initiated monitoring and evaluation to assess effectiveness of Section 3406 (b)(2) environmental measures

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $0 |
| 1994 | $605,598 |
| 1995 | $435,778 |
| 1996 | $1,296,689 |
| 1997 | $1,009,202 |
| 1998 | $1,105,113 |

Section 3406(b)(2) states, "The Secretary... is...authorized and directed to...dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and to help meet such obligations as may be legally imposed upon the Central Valley Project under State or Federal law following the date of enactment of this title, including but not limited to additional obligations under the Federal Endangered Species Act."

Management of water dedicated under Section 3406(b)(2) has been coordinated annually between Reclamation and the Service since 1993. Each year, as part of an interim implementation process, the Service has provided flow-related habitat objectives for use of this water, and Reclamation has modified operations as possible or necessary to meet the objectives. Interior has applied flow-related objectives on Clear Creek; the Sacramento, American, and Stanislaus Rivers; and the Delta.

Administrative tasks necessary for proper management and accounting of the water dedicated under this section began in 1994 as part of a long-term water management planning effort. Considerable debate occurred over interpretation of Section 3406 (b)(2), primarily regarding how the water may be used and how it should be accounted.

**Anticipated Benefits of Dedicated Yield**

- Instream temperatures suitable for incubation and juvenile anadromous fish rearing
- Restoration of instream habitat
- Improved migration conditions
- Assistance for riparian and wetland habitat restoration efforts

In December 1994, Interior issued draft guidelines on management of the water, and received comments from many sources. The draft guidelines were revised and reissued in September 1995.

Further discussions began in late 1995 when a large stakeholder work team identified a long list of issues surrounding management of the dedicated water. In June 1997, Interior released a draft Administrative Proposal and after a series of public outreach efforts, revised the draft in October, incorporating refinements suggested by the associated public forums. The final Administrative Proposal was released in November 1997 and described Interior's resolution on three major issues: (a) dedicating and managing the water; (b) the role of the "Toolbox," a stakeholder involvement process established to consider actions minimizing water supply impacts of implementing 3406 (b)(2) environmental measures; and (c) the crediting of 3406 (b)(2) water toward the State's Water Quality Control Plan.

Since 1993, the flow-related objectives have helped to protect winter-run chinook salmon and Delta smelt, species listed under the federal Endangered Species Act. Interior signed the Principles of Agreement (Bay-Delta Accord) in 1994, providing a portion of 3406 (b)(2) water to meet the CVP share of protecting the Delta. The Accord included the needs of Delta smelt and, depending on hydrologic conditions, annually used up to one-half of the water provided by Section 3406(b)(2).

To date, actions under this program have included improved instream flows from increased releases and/or increased reservoir carryover, Delta export curtailments, and Delta Cross Channel gate closures. Beyond the benefits for winter-run chinook salmon and Delta smelt, these efforts have provided benefits for other anadromous fish including greater adult attraction flows; better instream temperatures for spawning, incubation, and juvenile rearing; and improved flows for juvenile migration, resulting in increased anadromous fish production in Central Valley streams and the Delta. Application of dedicated water to meet anadromous fish needs has also assisted in restoring riparian and adjacent wetland habitats and estuarine areas, and has provided associated non-anadromous fish and wildlife benefits.

Adult salmon returning to Central Valley rivers and streams in fall 1995 were the first to utilize 1993 flow and export conditions improved, in part, as a result of Section 3406(b)(2). The numbers of returning adults were the best in years, and recreational and commercial harvests improved over the previous 2 years. Both 1996 and 1997 counts were equally improved, especially on Clear Creek, which has shown improvement since increased flows began in 1995. Although other factors undoubtedly played a role in these increases, actions taken under (b)(2) have played a major role. The extent of that role is being analyzed in many ongoing study and evaluation efforts.

**REPORTS PREPARED FOR SECTION 3406(b)(2)**

- Draft Water Management Plan, February 1996
- Draft Administration Proposal, July 1996
- Final Administrative Proposal, November 1997

# Supplemental Water Acquisition Program (Anadromous Fish Focus)

Reference Section of CVPIA: 3406(b)(3) Start Date: 1993 Status: Ongoing

### Objective

- Acquire supplemental water for improved instream flow on Central Valley rivers and streams

### Accomplishments

- Acquired 29,950 acre-feet of water for improved migration and spawning conditions for spring-run chinook salmon and steelhead on Battle Creek
- Acquired 284,612 acre-feet of water for improved migration and spawning conditions for fall-run chinook salmon on the Stanislaus, Tuolumne, Merced, and lower San Joaquin Rivers

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $0 |
| 1994 | $2,348,303 |
| 1995 | $4,640,070 |
| 1996 | $1,785,939 |
| 1997 | $12,682,750 |
| 1998 | $6,201,456 |

Section 3406(b)(3) states, "The Secretary...is authorized and directed to develop and implement a program in coordination and in conformance with the plan required under paragraph (1) of this subsection for the acquisition of a water supply to supplement the quantity of water dedicated to fish and wildlife purposes under paragraph (2) of this subsection and to fulfill the Secretary's obligations under paragraph 3406(d)(2) of this title. The program should identify how the Secretary intends to utilize, in particular the following options: improvements in or modifications of the operations of the project; water banking; conservation; transfers; conjunctive use; and temporary and permanent land fallowing, including purchase, lease, and option of water, water rights, and associated agricultural land."

Interior has focused its efforts to acquire water in those areas offering opportunities to meet the most urgent fish and wildlife water needs. Supplemental water acquisition focusing on anadromous fish occurred on Battle Creek and San Joaquin River tributaries. Total purchases for anadromous fish for 1994 through 1998 averaged nearly 63,000 acre-feet per year.

Battle Creek, a Sacramento River tributary, has exceptionally high restoration potential to support winter-run, tributary spring-run, fall-run, and late-fall run chinook salmon and steelhead. Flow in the north and south forks of Battle Creek is regulated for hydropower generation by the Pacific Gas and Electric Company (PG&E). One of the major restoration actions identified in the AFRP's draft Anadromous Fish Restoration Plan is to increase flow past PG&E's hydropower diversions.

Interior, the National Marine Fisheries Service, State of California, and PG&E are working to develop a long-term restoration plan for Battle Creek. To initiate restoration efforts, Interior compensates PG&E to maintain minimum year-round flows of 30 cfs on the north and south fork and mainstem of Battle Creek. PG&E contributes the first 12.5 cfs of flow without cost to Interior. Without this partnering arrangement, flows on Battle Creek could be as little as 3-5 cfs during summer and fall. Increasing the minimum flow provides improved emigration, migration, holding, spawning, and rearing habitat for spring-run chinook salmon and steelhead. This partnering arrangement has been in place since 1995 and is expected to continue through 2000, when long-term restoration actions are scheduled to be implemented.

The AFRP proposes to increase flows on the Stanislaus, Tuolumne, Merced, and lower San Joaquin Rivers to facilitate migration, attraction, production, and survival of fall-run chinook salmon. Since 1994, Interior has acquired temporary water supplies from willing sellers as needed for these purposes and to increase Reclamation's ability to meet flow and water-quality requirements specified in the

SWRCB Plan for the San Francisco Bay/ Sacramento-San Joaquin River Delta Estuary (May 1995) and requirements of the Biological Opinion for Delta smelt.

**WATER ACQUIRED FOR INSTREAM FLOWS FOR ANADROMOUS FISH (acre-feet)**

| Location | Willing Seller | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|
| **Sacramento River Basin** | | | | | | | |
| Battle Creek | Pacific Gas & Electric Co. | 0 | 0 | 8,410 | 12,330 | 9,210 | 0 |
| **San Joaquin River Basin** | | | | | | | |
| Stanislaus River | Oakdale and South San Joaquin Irrigation Districts | 0 | 15,000 | 33,119 | 0 | 50,000 | 50,000 |
| Tuolumne River | Modesto Irrigation District | 0 | 0 | 0 | 0 | 5,000 | 0 |
| Merced River | Merced Irrigation District | 0 | 15,000 | 15,000 | 16,161 | 45,332 | 30,000 |
| Lower San Joaquin River | San Joaquin River Exchange Contractors | 0 | 0 | 0 | 0 | 10,000 | 0 |
| | **TOTAL** | 0 | 30,000 | 56,529 | 28,491 | 119,542 | 80,000 |

**REPORTS PREPARED FOR SECTION 3406(b)(3)**

- EA and FONSI for interim Water Acquisition
- EA's for various water acquisition

# Clear Creek Fishery Restoration

Reference Section of CVPIA: 3406(b)(12) Start Date: 1996 Status: Ongoing

### Objectives

- Increase minimum flows to increase salmon and steelhead populations
- Restore the degraded stream channel
- Improve salmon and steelhead passage at McCormick-Saeltzer Dam
- Improve spawning habitat by introducing spawning gravel below dams
- Reduce watershed erosion and fine sediment which kills salmon and steelhead eggs

### Accomplishments

- Maintained October to May instream flow of 150-plus cubic feet per second, 1995 through 1998
- Completed phase 1 of channel restoration
- Developed a comprehensive proposal for restoration of the lower Clear Creek channel
- Selected a preferred alternative for improving fish passage at McCormick-Saeltzer Dam
- Placed 22,000 tons of spawning gravel into Clear Creek, 1995 through 1997
- Participated in watershed restoration planning
- Decreased fine sediment input because of erosion control activities

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1996 | $279,144 |
| 1997 | $591,553 |
| 1998 | $1,073,057 |

Section 3406(b)(12) states, "The Secretary... is...authorized and directed to...develop and implement a comprehensive program to provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead from Whiskeytown Dam as determined by instream flow studies conducted by the California Department of Fish and Game after Clear Creek has been restored and a new fish ladder has been constructed at the McCormick-Saeltzer Dam."

Interior has worked closely with DFG, DWR, the National Park Service, Bureau of Land Management, county and local agencies and organizations, stakeholder groups, and the general public to provide planning and implementation of restoration actions in the Clear Creek watershed. Restoration focused on increases in minimum flows, river channel restoration, fish passage at McCormick-Saeltzer Dam, spawning gravel improvement, and watershed management including upland erosion and wildfire fuels control.

Historically, 100 cfs was released from Whiskeytown Dam in November and December and 50 cfs the remaining months. Between 1995 and 1998, the amount released between October and May was increased to 150 or 200 cfs. This additional flow was formalized under Section 3406(b)(2) in November 1997. Additional flow in Clear Creek improved fish passage, decreased water temperatures, and increased spawning and rearing habitat for chinook salmon and steelhead.

Past gravel mining activities in the channel have removed a majority of the gravel and created many gravel pits and braided channels. In fiscal year 1998, phase I of a channel restoration plan was completed, filling several braided channels and eliminating streamflow into a large gravel pit. This effort removed a significant stranding problem for anadromous fish and concentrated flow in the main channel to improve adult fish passage.

McCormick-Saeltzer Dam blocks access for spawning salmon and steelhead to 10 miles of habitat upstream. This Section 3406 (b)(12) program is exploring alternatives to solve this passage problem. The preferred alternative is to remove the dam and replace the existing irrigation diversion. The alternative will be studied further before a solution is implemented.

The lack of spawning sized gravel in Clear Creek is a major limiting factor for salmon and steelhead. In 1995 and 1996, 7,000 tons of spawning gravel were introduced below McCormick-Saeltzer Dam; in 1997, 4,500 tons were placed below Whiskeytown Dam and 3,500 tons below McCormick-Saeltzer Dam. High water flows naturally distributed these gravels downstream, creating new spawning riffles.

In 1996, the Clear Creek Coordinated Resource Management Planning Group was formed to help coordinate restoration activities and increase public involvement on Clear Creek. Composed primarily of local landowners within the Clear Creek watershed, the group released the Lower Clear Creek Watershed Management Plan in September of 1998. Restoration activities outlined in the plan were, and will continue to be, used to assist in meeting Interior's restoration goals and objectives. The plan provides for many associated efforts including the completion of inventories and actions for control of erosion and wildfire fuels within the watershed.

Over the last 6 years, adult chinook salmon escapement in Clear Creek has increased dramatically. While all CVPIA restoration activities in the watershed have benefited instream resources, the most significant contribution thus far has been the increase in baseline instream flows. Since flows were increased, fall-run chinook salmon escapement increased to an average 8,000 fish annually from 1996 to 1998. This represents a 400 percent increase over the baseline average of 1,584 fish from 1967 to 1991.

**REPORTS PREPARED FOR SECTION 3406(b)(12)**

- Benefits of Increased Minimum Instream Flows on Chinook Salmon and Steelhead in Clear Creek, Shasta County, California, 1995-1996
- Lower Clear Creek Watershed Analysis
- Lower Clear Creek Erosion Inventory

# Gravel Replenishment and Riparian Habitat Protection

Reference Section of CVPIA: 3406(b)(13) Start Date: 1995 Status: Ongoing

### Objectives

- Restore and replenish spawning gravel for salmon and steelhead
- Reestablish river meander belts
- Limit bank protection activities

### Accomplishments

- Placed 44,000 tons of gravel in the Sacramento River for salmon and steelhead spawning
- Developed a draft Long-Term Restoration and Protection Plan for the American, Stanislaus, Sacramento Rivers
- Placed 1,000 tons of gravel in the Stanislaus River, resulting in salmon spawning there for the first time in 13 years
- Participated in efforts to fill an in-river pit and reconfigure a portion of the stream channel on the Stanislaus River
- Assisted DFG in continuing a spawning gravel management program on the American River

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1995 | - - |
| 1996 | $554,355 |
| 1997 | $778,345 |
| 1998 | $87,457 |

Section 3406(b)(13) states, "The Secretary... is authorized and directed to...develop and implement a continuing program for the purpose of restoring and replenishing, as needed, spawning gravel lost due to the construction and operation of Central Valley Project dams, bank protection projects, and other actions that have reduced the availability of spawning gravel and roaming habitat in the Upper Sacramento River from Keswick Dam to Red Bluff Diversion Dam [and] in the American and Stanislaus Rivers downstream from the Nimbus and Goodwin Dams, respectively. The program shall include preventive measures, such as re-establishment of meander belts and limitations on future bank protection activities, in order to avoid further losses of instream and riparian habitats."

Work to restore anadromous fish spawning substrate in the upper Sacramento River began in 1995 and resulted in placement of 10,000 tons of gravel below Keswick Dam in 1996. Another 34,000 tons were placed in the river in 1997. An Interagency Technical Team created under this section assisted in developing draft Long-Term Restoration and Protection Plans for spawning habitat in the American, Stanislaus, and Sacramento Rivers.

On the Stanislaus River in 1997, approximately 1,000 tons of gravel were placed downstream from Goodwin Dam, resulting in salmon spawning in the area for the first time in 13 years. Also, several agencies working together initiated a project to fill an in-river pit used by fish species predatory to juvenile anadromous fishes. When complete, this project will also reconfigure the stream channel and substrate at a site approximately 6 miles below Goodwin Dam.

On the American River, DFG surveyed spawning gravel and completed a summary report on recommended gravel management. This program participates with and supports DFG in a pilot gravel management project on the river. Because of high instream flows during 1997, work focused on reaffirming American River "pre-project" conditions. Based on this work, manipulation of gravels such as streambed ripping and gravel placement in selected riffles will be done in 1999.

**Gravel Replenishment under the CVPIA**

- 1996 - Sacramento River below Keswick Dam, 10,000 tons
- 1997 - Sacramento River below Keswick Dam, 10,000 tons
- 1997 - Sacramento River downstream from Keswick at Salt Creek, 24,000 tons
- 1997 - Stanislaus River downstream from Goodwin Dam, 1,000 tons

**REPORT PREPARED FOR SECTION 3406(b)(13)**

- Long-Term Restoration and Protection Plan for the Sacramento River

# Trinity River Fishery Flow Evaluation Program

Reference Section of CVPIA: 3406(b)(23) Start Date: 1993 Status: Ongoing

### Objective

- Determine the effectiveness of increased flows and other habitat restoration measures on habitat and fishery populations in the Trinity River

### Accomplishments

- Prepared and released draft and final reports concerning the effectiveness of increased flows on anadromous fish populations
- Completed draft EIS/EIR in October 1999

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $420,000 |
| 1994 | $344,000 |
| 1995 | $904,000 |
| 1996 | $740,000 |
| 1997 | $300,000 |
| 1998 | $500,000 |

Section 3406(b)(23) states, "The Secretary...in consultation with other State and Federal agencies, Indian tribes, and affected interests, is authorized and directed to...provide through the Trinity River Division, for water years 1992 through 1996, an instream release of water to the Trinity River of not less than 340,000 acre-feet per year...and by September 30, 1996, after consultation with the Hoopa Valley Tribe, shall complete the Trinity River Flow Evaluation Study currently being conducted by the U.S. Fish and Wildlife Service...Not later than December 31, 1996, the Secretary shall forward the recommendations of the Trinity River Flow Evaluation Study to...[Congress]."

The Service initiated a Trinity River Fishery Flow Evaluation Program in 1985. The purpose of the program was to evaluate the effects of increased riverflows and other habitat restoration efforts on fishery habitat and the anadromous fish resources in the Trinity River. In January 1998, a draft Trinity River Fishery Flow Evaluation Report was released for peer and interested party review. The report included salmonid habitat measurement at an intermediate fishery flow and studies on the effects of Trinity River flows on riparian vegetation, water temperatures, and sediment transport. The final report was completed in spring 1999.

An Environmental Impact Statement/Environmental Impact Report (EIS/EIR) is also being prepared to analyze a range of alternatives for restoring and maintaining the natural production of anadromous fish populations of the Trinity River downstream of Lewiston Dam. The EIS/EIR will describe the impacts of increasing flows above 340,000 acre-feet, as well as other alternatives. A draft EIS/EIR was completed in October 1999. A final EIS/EIR and a final decision are expected in fall 2000.

**REPORTS PREPARED FOR SECTION 3406(b)(23)**

- Draft Trinity River Flow Evaluation Report, January 1998
- Final Trinity River Flow Evaluation Report, April 1999
- Draft EIS/EIR, October 1999

# APPENDIX D

# Anadromous Fish - Structural Measures

# Appendix D Anadromous Fish - Structural Measures

# Tracy Pumping Plant Mitigation

Reference Section of CVPIA: 3406(b)(4) Start Date: 1998 Status: Ongoing

### Objective

- Mitigate fishery impacts associated with Tracy Pumping Plant operations

### Accomplishments

- Developed new predator removal operations
- Increased biological oversight of pumping operations
- Developed an expanded program with more focused research
- Developed new fisheries laboratories and aquaculture facilities
- Improved and modified existing facilities

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1998 | $39,743 |

Section 3406(b)(4) states, "The Secretary ... is authorized and directed to...develop and implement a program to mitigate for fishery impacts associated with operation of the Tracy Pumping Plant. Such a program shall include, but is not limited to, improvement or replacement of the fish screen and fish recovery facilities and practices associated with the Tracy Pumping Plant."

Since 1990, Reclamation has been improving fish survival at the Tracy Fish Collection Facilities under the Tracy Fish Facility Improvement Program. This program is a cooperative effort between Reclamation's Mid-Pacific Region and Denver Technical Service Center, and is coordinated with other agencies including the Service, National Marine Fisheries Service, DFG, and DWR.

Reclamation is identifying and making physical improvements and operational changes, assessing fishery conditions, and monitoring salvage operations at the collection facility. Activities are being performed in conformance with existing Endangered Species Act Biological Opinions, operating permit requirements, and agreements reached with DFG in 1992.

**Biological Benefits**

- Reduce fish mortality at Tracy fish screen
- Reduce entrainment of fish at the fish screen
- Improve conditions for salmon, striped bass, American shad, and Delta smelt

The program was expanded in 1998 to include activities leading to development of a modern on-site demonstration fish screen, the Tracy Experimental Fish Facility. It is anticipated that this experimental facility will be used to evaluate new technologies for replacement of the existing 40-year-old facilities. Such a facility will permit testing and evaluation of all aspects of the fish salvage program at Tracy and will support technological research needed by CALFED for other South Delta fish screen needs.

**Possible Tracy Experimental Fish Facility Evaluations**

- Separate debris from entrained fish
- Separate larger predatory fish from juvenile fish
- Provide fish-friendly pumps and lifting devices to safely transport sensitive species
- Evaluate screen-cleaning mechanisms
- Improve overall handling and fish transportation
- Develop optimum fish screen configuration and operation of bypass flows

Prior to fiscal year 1998, funding for this program was obtained from Reclamation appropriations for activities other than implementation of the CVPIA. In fiscal year 1998, CVPIA funding was made available for work at the Tracy Pumping Plant.

# Contra Costa Canal Pumping Plant Mitigation

Reference Section of CVPIA: 3406(b)(5) Start Date: 1996 Status: Ongoing

### Objective

- Mitigate fishery impacts of the Contra Costa Pumping Plant diversion at Rock Slough

### Accomplishments

- Established multiagency management and technical teams
- Prepared a Project Management Plan
- Completed feasibility evaluation and designs
- Completed Value Engineering Report
- Performed laboratory-model test of screen structure and cleaner mechanisms
- Completed environmental evaluation requirements
- Prepared an Environmental Commitments Report

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1996 | $58,694 |
| 1997 | $441,352 |
| 1998 | $1,196,226 |

Section 3406(b)(5) states, "The Secretary.... is authorized and directed...to develop and implement a program to mitigate for fishery impacts resulting from operations of the Contra Costa Canal Pumping Plant No. 1. Such program shall provide for construction and operation of fish screening and recovery facilities, and for modified practices and operations."

In fiscal year 1996, the Contra Costa Fish Screen Management Team and the Contra Costa Technical Advisory Committee were established, consisting of representatives from DFG, DWR, the Service, Reclamation, National Marine Fisheries Service, and Contra Costa Water District. These two groups have been assisting in the development and implementation of the fish screen project for the Rock Slough intake of the Contra Costa Canal. In addition, a Peer Review Team reviews planning and design documents.

The Peer Review Team reviewed preliminary conceptual designs and recommended improvements for the fish screen project. The Value Engineering Team explored cost saving alternatives and made recommendations for the conceptual designs. Environmental documentation was completed, and an agreement was signed to provide funding participation from the State of California. Remaining technical and policy issues are being resolved by the technical and management teams. Specifications and drawings for the fish screen project will be ready for solicitation in spring 2000. The contract for phase 1 of the construction is anticipated to be awarded in May 2000, with construction slated to begin in July 2000. Phase 2 of construction is expected to be initiated in 2001.

**REPORTS PREPARED FOR SECTION 3406(b)(5)**

- Phase I Feasibility/Pre-design Report
- Phase II Concept/Alternatives Report
- Project Management Plan
- Value Engineering Report
- Environmental Assessment and Initial Study
- Environmental Commitments Report
- Miscellaneous Design Reports

# Shasta Temperature Control Device

Reference Section of CVPIA: 3406(b)(6) Start Date: 1993 Status: Ongoing

### Objective

- Allow selective withdrawal of water from Shasta Reservoir to improve temperatures in the Sacramento River to benefit winter-run chinook salmon and other anadromous fish species without bypassing power generation

### Accomplishments

- Completed construction and began operation of the TCD on February 28, 1997
- Operated TCD in 1997 and 1998 to reduce river temperatures downstream without bypassing power generation operations

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $1,802,807 |
| 1994 | $1,710,555 |
| 1995 | $25,911,631 |
| 1996 | $41,292,648 |
| 1997 | $7,156,076 |
| 1998 | $2,327,248 |

Section 3406(b)(6) states, "The Secretary, in consultation with other State and Federal agencies, Indian tribes, and affected interests, is...authorized and directed to...install and operate a structural temperature control device at Shasta Dam and develop and implement modifications in CVP operations as needed to assist in the Secretary's efforts to control water temperatures in the upper Sacramento River in order to protect anadromous fish in the upper Sacramento River."

Instream conditions (especially water temperature) in the upper Sacramento River were found to be inadequate for many native fish species, especially the federally listed winter-run chinook salmon, during summer and fall months. During the summers of 1987-1993, temporary river temperature improvement downstream from Shasta Dam was achieved by releasing water through the Shasta Dam lower outlet works, bypassing the Shasta powerplant. Although this operation assisted in meeting instream temperature needs for chinook salmon, it resulted in a loss in power generation in excess of $35 million over a 7-year period.

The purpose of the Shasta Temperature Control Device (TCD) is to allow the selective withdrawal of water from Shasta Reservoir to enhance downstream temperatures in the Sacramento River without bypassing power generation. Shasta Reservoir, a feature of the CVP located on the Sacramento River just northwest of Redding, stores up to 4.5 million acre-feet of water providing flood control and water for urban, agricultural, power, and environmental benefits.

The TCD includes a gated shutter structure 250 feet wide and 300 feet high that encloses all five powerplant penstock intakes. A low-level intake structure measuring 125 feet wide and 170 feet high accesses the deeper, colder water near the center of the dam and diverts it to the shutter structure. This 8,000-ton, 300-foot-tall steel-frame structure is connected to the upstream face of the dam. A series of gates allows the withdrawal of water at various lake levels, helping with the control of water temperatures downstream.

In 1993, planning and design efforts resulted in the completion of a contract to construct the Temperature Control Device at Shasta Dam. Construction began in November of 1994 and was completed in 1997. After a series of structural load performance tests, the TCD was approved for operation in February 1997.

The temperature device draws water of different temperatures from different reservoir depths. Its operation has increased the ability to control river temperatures, turbidity, and dissolved oxygen, without bypassing power generation. The TCD has benefited upper Sacramento River salmon populations while better allowing CVP operations to meet existing water and power contractual obligations.

The Shasta TCD, which cost approximately $80 million to build, is operated remotely from the Central Valley Control Center in Sacramento.

Contract closeout, preparation of inspection documents, and drafting of standard operating procedures were ongoing during FYs 1997 and 1998. In FY 1998 a one-year underwater inspection of the TCD structure was conducted to evaluate the protective coating needed for protection of the structure. The final construction report and transfer stipulations will be completed in FY 2000.

**REPORTS PREPARED FOR SECTION 3406(b)(6)**

- Shasta Dam Fish Entrainment Study, Pre-TCD Evaluation
- First Year Performance of the Shasta Dam Temperature Control Device
- Shasta TCD Transfer Stipulation Report
- Physical Forcing of Phytoplankton Bloom Dynamics in Shasta Lake, CA
- Pre- and Post-Operational Effects of Temperature Control Device on Physical, Chemical, and Biological Attributes of Shasta Lake, CA, Phase 1, Spring 1995 Through Fall 1997

# Red Bluff Dam Fish Passage Program

Reference Section of CVPIA: 3406(b)(10) Start Date: 1993 Status: Ongoing

## Objectives

- Improve upstream and downstream passage of anadromous fish and other species
- Deliver water at the time and quantity required by users including the Sacramento National Wildlife Refuge
- Implement improvements to existing operations and facilities to benefit fish passage and water delivery
- Maintain Lake Red Bluff and other authorized CVP uses
- Solve fish passage problems while incorporating changes in environmental, institutional, and regulatory environments

## Accomplishments

- Conducted studies to evaluate impacts of Research Pumping Plant, including 97-99% survival of juvenile salmon
- Modified the Research Pumping Plant facility to assist in its operation
- Conducted studies to evaluate long-term fish passage and water delivery solutions at Red Bluff Diversion Dam
- Modified Red Bluff Diversion Dam facilities to meet needs of anadromous fish and water users

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $9,754,979 |
| 1994 | $6,553,673 |
| 1995 | $3,871,389 |
| 1996 | $3,420,577 |
| 1997 | $2,308,180 |
| 1998 | $1,792,222 |

Section 3406(b)(10) states, "The Secretary is...authorized and directed to...develop and implement measures to minimize fish passage problems for adult and juvenile anadromous fish at the Red Bluff Diversion Dam in a manner that provides for the use of associated Central Valley Project conveyance facilities for delivery of water to the Sacramento Valley National Wildlife Refuge complex..."

Red Bluff Diversion Dam (RBDD) provides for the diversion of Sacramento River water into the Corning and Tehama-Colusa Canals. The dam has affected anadromous fish by delaying and blocking adult migration, entraining juveniles into diversion canals, killing or injuring juveniles passing through the dam, and increasing juvenile predation due to disorientation as they pass through the dam.

Implementation of this section provides for the continuation of the Red Bluff Diversion Dam Fish Passage Program, started in the late 1980's. This program has evolved through several phases in which fish passage problems were researched and a variety of alternative solutions were evaluated at a preliminary level of analysis. Early solution to the fish passage problem was to remove the gates of the dam and allow the Sacramento River flow unimpeded. This solution, however, affected recreation at Lake Red Bluff immediately upstream from the dam and affected water diversions in the Tehama-Colusa Canal (TCC).

**Potential Benefits of Program**

- Improved access to habitat for salmon and steelhead spawning
- Better survival rates for downstream-migrating juveniles
- Improved passage for sturgeon, American shad, and striped bass
- More dependable water deliveries to contractors

The interim approach to solving fish passage problems at RBDD currently includes: use of CVP water from Black Butte Reservoir located on Stony Creek to supply water to TCC; use of the Research Pumping Plant during key spring and fall periods; and modifications to facilities and operations during the time when the RBDD gates are out of the water to maximize the use of available water supplies. These interim actions have provided a balance for both natural resource protection and water deliveries.

Program activities have been grouped into four categories: Research Pumping Plant (RPP), planning studies, improvements to existing facilities, and other actions.

The purpose of the RPP is to research development of innovative "fish-friendly" pumps to meet water delivery demands when the RBDD gates are out of the river. Reclamation and the Service began baseline studies in 1994 and later entered into a cooperative agreement to conduct additional research when the RPP was completed in 1995.

| Research Pumping Plant Activities | Year |
|---|---|
| Monitoring and population estimates of juvenile salmon | 1994 (ongoing) |
| Field studies to evaluate injury and mortality rates to fish entrained in the existing fish bypass system | 1994 (complete) |
| Evaluation of predator dynamics | 1994 (ongoing) |
| Mechanical evaluations of pumps and facilities | 1995 (ongoing) |
| Evaluations of the RPP operational and hydraulic characteristics | 1995 (ongoing) |
| Study to develop fish handling and experiment techniques | 1995 (complete) |
| Evaluation of juvenile salmonid survival/injury through pumps | 1995 (ongoing) |
| Monitoring of entrapment of juvenile anadromous larval fish by pumping plant | 1995 (ongoing) |
| Studies of bypass pipeline to determine residence time and survival of juvenile salmon | 1997 (ongoing) |
| Radio telemetry tracking of adult Sacramento pikeminnow and adult chinook salmon | 1997 (ongoing) |
| Instrumentation and automation of pump operation and maintenance features | 1998 (complete) |
| Installation of additional baffles on the vee-screen structure | 1998 (complete) |
| Repair of pump variable speed drive | 1998 (complete) |
| Evaluation of colonization of intake sump area by predatory fish species | 1998 (ongoing) |
| Evaluation of stress and disorientation of juvenile chinook salmon | 1998 (ongoing) |

The planning studies were designed to evaluate technical and environmental issues associated with solutions to fish passage and water delivery problems at Red Bluff Diversion Dam.

| Planning Studies | Year |
|---|---|
| Report on RBDD fish bypass alternatives | 1995 |
| Study of recreational activity near the RBDD | 1996 |
| Physical model of water delivery requirements | 1997 |
| Assessment of water delivery requirements | 1997(ongoing) |

In an effort to improve existing facilities, annual operation and maintenance actions were implemented to benefit anadromous fish and water delivery capabilities at Red Bluff Diversion Dam.

| Improvements to Existing Facilities | Year |
|---|---|
| Modified contour of East Sand Slough to prevent entrapment of fish during low water levels | 1993 |
| Evaluated approach velocities to the existing rotary drum screen when gates are lowered | 1993 |
| Modified west bank fish ladder entrance to improve fish attraction and entrance conditions | 1994 |
| Improved fish screens for a series of temporary pumps | 1996 |

Other actions taken to improve resource protection and water delivery capabilities at Red Bluff Diversion Dam included evaluating and permitting the use of Stony Creek as part of the interim solution to fish passage.

| Other Actions | Year |
|---|---|
| Receipt of State Water Resources Control Board permit to allow re-diversion of CVP water stored in Black Butte Reservoir into the Tehama-Colusa Canal | 1996 |
| Prepared Water Use and Management Plan for the lower Stony Creek watershed | 1998 |

# Coleman National Fish Hatchery Restoration and Keswick Fish Trap Modification

Reference Section of CVPIA: 3406(b)(11) Start Date: 1994 Status: Ongoing

### Objectives

- Improve conditions for production of hatchery-raised fish at Coleman Fish Hatchery, including installation of ozone treatment for disease control
- Improve operation of and anadromous fish survival at the Keswick Dam Fish Trap

### Accomplishments

- Selected a preferred alternative for treatment of water supply at Coleman Fish Hatchery
- Installed ozonation equipment and made necessary facility modifications
- Initiated Level 1 water treatment with a capacity of 45,000 gpm by filtration and 30,000 gpm by ozone treatment
- Established the Livingston Stone Fish Hatchery
- Completed designs and associated purchases for modification of the Keswick Dam Fish Trap

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $1,685,834 |
| 1995 | $1,360,509 |
| 1996 | $2,289,223 |
| 1997 | $2,632,601 |
| 1998 | $7,852,348 |

Section 3406(b)(11) states, "The Secretary...is...authorized and directed to...rehabilitate and expand the Coleman National Fish Hatchery by implementing the U.S. Fish and Wildlife Service's Coleman National Fish Hatchery Development Plan, and modify the Keswick Dam Fish Trap to provide for its efficient operation at all project flow release levels and modify the basin below the Keswick Dam spillway to prevent the trapping of fish."

The 50-year-old Coleman National Fish Hatchery is the downstream most of eight hatcheries on Battle Creek. Because migrating anadromous fish typically carry a myriad of diseases, the hatchery's water supply must be protected before these fish can be allowed to migrate upstream beyond its water source. Protecting the hatchery's water supply will allow migration past the water source and access to 42 miles of habitat in upper Battle Creek.

Planning efforts in the 1980's resulted in completion of the Coleman National Fish Hatchery Development Plan, which prioritized recommendations for rehabilitation and development at Coleman. A Water Treatment Cost Study and Alternatives Analysis was completed for Coleman in March 1997, assisting water treatment decisions and associated NEPA processes. NEPA evaluations resulted in a significant reduction in the amount of water previously thought necessary for ozonation at the facility.

Several physical and water treatment options have been implemented at Coleman since enactment of the CVPIA. In 1994, rehabilitation began on 28 badly deteriorated rearing ponds. From 1995 to 1998, equipment necessary for improving the hatchery water supply was installed, including oxygen and ozone generation equipment, ozone removal equipment, water pumping and distribution facilities, and sand filters. In addition, improvements to the hatchery's water intake on Battle Creek were initiated. A permanent solution that complies with National Marine Fisheries Service screening criteria will be completed in the near future.

Current facilities allow for the ozonation of 10,000 gallons per minute (gpm) of fish production water and the potential treatment of 45,000 gpm by filtration and 30,000 gpm by ozonation. When water treatment potentials have been reached, a 5- to 7- year test period will evaluate efficiency of the system and provide information to help determine the need for any additional disinfection capacity.

In 1997, the CVPIA provided over $1 million to establish the Livingston Stone Fish Hatchery on the Sacramento River. The hatchery allows for rearing of winter-run chinook salmon in a Sacramento River water supply. Early operations required winter-run salmon, taken at the Keswick Dam Fish Trap on the Sacramento

River, to be reared at the Coleman Hatchery. This process potentially imprinted future returning adult winter-run salmon to Battle Creek water chemistry, possibly hampering their recovery in the Sacramento River.

The fish trap at Keswick Dam (on the Sacramento River) is used to collect broodstock for production at both the Coleman and Livingston Stone hatcheries. Historically, the trap has operated inefficiently, failing to efficiently trap and maintain fish at higher flows and to provide a safe work environment for fish collection and making repairs. Section 3406(b)(11) allows for modification of the trap at Keswick to make it more efficient and safe at all flows.

Design modifications of the Keswick Dam Fish Trap were completed in 1996, including designs allowing operators to dewater the trap and close it off from the Sacramento River. These modifications will increase the trap's operational capacity from 15,000 cubic feet per second to 36,000 cubic feet per second and will enhance capture of winter-run chinook salmon during high releases from Keswick Dam.

To date, efforts at Keswick Dam have included development of standard operating procedures for fish salvage (interim measures to rescue fish stranded in the stilling basin were successful), purchase of bulkhead stop-log structures, purchase of a blower system and four winches for operating the stoplogs, and purchase of a dewatering pump and associated electrical power supply.

**REPORTS PREPARED FOR SECTION 3406(b)(11)**

- Water Treatment Cost Study and Alternatives Analysis
- EA and FONSI

# Anderson-Cottonwood Irrigation District Fish Passage

Reference Section of CVPIA: 3406(b)(17) Start Date: 1996 Status: Ongoing

### Objectives

- Eliminate or avoid dewatering of redds and stranding of juveniles caused by operation of ACID Diversion Dam
- Improve fish passage and decrease fish injury at ACID Diversion Dam and increase access to 3.6 miles of habitat between ACID Diversion and Keswick Dams
- Reduce entrainment of juvenile salmonids into ACID canal

### Accomplishments

- Eliminated dewatering of redds and stranding of juvenile salmon upstream from ACID Dam by modifying the dam's structure and operations
- Created ACID Fish Passage Team to plan, design, and implement successful resolution of fishery problems
- Reached consensus on how to resolve all fishery passage problems at ACID
- Evaluated effectiveness of fish passage through old fish ladder
- Finished preliminary designs and permitting and obtained final design funding for two new fish ladders and a new fish screen

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1996 | $0 |
| 1997 | $14,349 |
| 1998 | $309,462 |

Section 3406(b)(17) states, "The Secretary...is authorized and directed to develop and implement a program to resolve fishery passage problems at the Anderson-Cottonwood Irrigation District Diversion Dam as well as upstream stranding problems related to Anderson-Cottonwood Irrigation District Diversion Dam operations."

The Anderson-Cottonwood Irrigation District (ACID) Diversion Dam is within critical habitat and spawning grounds of the endangered winter-run chinook salmon, and within crucial habitat for three other runs of chinook salmon (fall, late fall, and spring) that are being considered for listing under the Federal Endangered Species Act, and Central Valley steelhead, which were listed in 1998 as federally threatened.

ACID Diversion Dam is installed annually in April and removed in November. A catwalk suspended above the dam allows workers to install wooden flashboards to raise or lower the dam level. Installing or removing the heavy flashboards was unsafe and impossible during even moderate flows, making it necessary for Reclamation to reduce Sacramento River flows to allow ACID to change the dam level. Reducing riverflows stranded fish and dewatered salmon spawning areas, often killing eggs and young. In 1996 and 1997, Interior designed and funded the manufacture of lightweight flashboards and a new catwalk, allowing ACID to use the flashboards safely at higher flows. Also, ACID signed an agreement with Reclamation eliminating requests for flow reductions below 10,000 cubic feet per second for adjustment of the dam.

The ACID Diversion Dam has two fish ladders, both of which require replacement. One ladder is old and undersized, and its entrance is poorly oriented for passage of salmon and steelhead. The Service evaluated the structure's effectiveness and determined that only a small percentage of salmon in the river use the ladder. The other fish ladder, small and temporary, was installed in 1991. Newly designed fish ladders will provide better access to prime spawning habitat upstream from the dam.

Historically, the existing fish screen on the ACID diversion has failed due to high debris loads when salmon are emerging and in most need of a screening structure. Because ACID has a high rate of diversion during periods when winter-run chinook salmon emerge from spawning gravels, it is important that the facility is well screened. Also, with the listing of Central Valley steelhead, the screen no longer meets the requirements of the Endangered Species Act. A heavier, more adequate screen has been designed in coordination with the Anadromous Fish Screen Program.

In 1997, a team was organized to plan, design, and implement the resolution of fishery problems at ACID. The team agreed on the objectives and methods to resolve all fish passage problems. Preliminary designs and environmental permitting were finished in 1998. Funding for final design and construction bid documents was obtained by ACID with the assistance of the team.

# Glenn-Colusa Irrigation District Pumping Plant

Reference Section of CVPIA: 3406(b)(20) Start Date: 1993 Status: Ongoing

## Objectives

- Provide state-of-the-art fish screens that are reliable, cost effective, and minimize fish losses
- Enable GCID to meet instantaneous peak demands and provide reliable long-term deliveries
- Minimize the potential for failure of the fish screen because of changes in Sacramento River alignment or gradient

## Accomplishments

- Initiated construction of the fish screen facility and adjacent channel improvements
- Completed construction of the water control structure and access bridge
- Completed concept-level design of the gradient facility and initiated final design
- Initiated design of fish screen system testing program
- Began partial offsite mitigation by transplanting elderberry shrubs from the fish screen area to an adjacent parcel

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $259,237 |
| 1994 | $1,296,731 |
| 1995 | $800,874 |
| 1996 | $1,379,055 |
| 1997 | $1,376,455 |
| 1998 | $11,606,499 |

Section 3406(b)(20) states, "The Secretary...is...authorized and directed to...participate with the State of California and other Federal agencies in the implementation of the on-going program to mitigate fully for the fishery impacts associated with operations of the Glenn-Colusa Irrigation District's Hamilton City Pumping Plant. Such participation shall include replacement of the defective fish screens and fish recovery facilities associated with the Hamilton City Pumping Plant."

Fishery impacts associated with operation of the Glenn-Colusa Irrigation District's (GCID) Hamilton City Pumping Plant have been significant. Although GCID's intake channel allows water not diverted through the plant's pumps to flow back to the river, the pumping velocity prevents small fish from escaping back to the river with the flow. Thus, fish screens that allow for the escapement of these small fish back to the river are required.

The current effort to design a state-of-the art fish screening system started in the late 1980's. Information from this effort was incorporated into the program to implement Section 3406(b)(20). This program involves a multi-agency team including Reclamation, the Service, U.S. Army Corps of Engineers, National Marine Fisheries Service, DWR, State Reclamation Board, DFG, and GCID.

**REPORTS PREPARED FOR SECTION 3406(b)(20)**

- Biological Assessments/Biological Opinions
- Joint State-Federal EIR/EIS
- Gradient Restoration Facility Limited Reevaluation Report
- Value Engineering for fish screen system
- Design reports
- Fish and Wildlife Coordination Act Report

In 1993, a draft feasibility report presented a wide range of screen designs and locations as well as other facilities in the Sacramento River mainstem for restoring the hydraulic gradient at the screen. A Sacramento River gradient facility is being constructed under separate authorization by the Corps of Engineers. During this period, GCID installed flat-plate screen panels on the upstream face of the existing drum screen facility and modified intake and discharge channels to improve hydraulic conditions for returning fish to the river. These interim measures allowed GCID to continue to pump part of its water allocation while meeting fish protection requirements.

In 1994, Interior and the Corps of Engineers initiated the design phase of the project, focusing on the most favorable alternatives identified in the feasibility study. Concept-level designs were developed with significant input and oversight by the participating agencies. Criteria were also developed to aid in selecting the best overall alternative for final design. In 1995, physical and numerical model studies were initiated to better analyze characteristics of the alternatives. These studies showed that a fish screen in the vicinity of the existing screens was the preferred location.

In December 1996, the involved agencies agreed on the preferred alternative, which includes a retrofit and extension of the existing fish screen structure, channel modifications, a gradient facility in the river, and appurtenant facilities.

During 1996 and 1997 final designs were completed for the fish screen and open channel work. Three additional physical model studies were required to ensure the hydraulic designs would meet fish protection requirements. In addition, environmental compliance requirements were completed, including a joint State-Federal EIR/EIS, State and Federal Biological Assessments and Opinions, a Fish and Wildlife Coordination Act report, and various construction permits.

Construction was initiated on the fish screen extension and open channel work in spring 1998. A replacement water control structure and access bridge were completed just downstream from the existing fish screen structure along with placement of a cofferdam for the 634-foot-long fish screen structure extension. Materials are being fabricated for the retrofit of the existing fish screen. The Corps completed concept designs of the gradient facility using a physical model to study associated flow characteristics, and final design of the onsite mitigation planting requirements. Mitigation for the fish screen was initiated by transplanting elderberry shrubs from the fish screen construction area to an adjacent site. A fish screen system testing program and operation and maintenance manual were drafted and are being reviewed by the cooperating agencies.

# Anadromous Fish Screen Program

Reference Section of CVPIA: 3406(b)(21) Start Date: 1994 Status: Ongoing

## Objectives

- Develop a basinwide strategy to control anadromous fish loss at diversions
- Implement measures to avoid anadromous fish loss at diversions

## Accomplishments

- Established Anadromous Fish Screen Program technical and policy teams
- Completed documentation for program description, screen monitoring and maintenance, and environmental compliance
- Accepted 19 proposals to the program
- Initiated construction on 16 projects, 10 of which were completed
- Compled planning on 2 projects

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $838,957 |
| 1995 | $2,665,025 |
| 1996 | $8,202,526 |
| 1997 | $11,062,634 |
| 1998 | $4,863,481 |

Section 3406(b)(21) states, "The Secretary, in consultation with other State and Federal agencies, Indian tribes, and affected interests, is...authorized and directed to...assist the State of California in efforts to develop and implement measures to avoid losses of juvenile anadromous fish resulting from unscreened or inadequately screened diversions on the Sacramento and San Joaquin rivers, their tributaries, the Sacramento-San Joaquin Delta, and the Suisun Marsh. Such measures shall include but shall not be limited to construction of screens on unscreened diversions, rehabilitation of existing screens, replacement of existing non-functioning screens, and relocation of diversions to less fishery-sensitive areas."

The Anadromous Fish Screen Program was established to reduce fish mortality associated with diversions in the Central Valley. Currently, 2,109 agricultural diversions are located in the Delta, 450 in the Sacramento River system, 152 in the San Joaquin River system, and 370 in the Suisun Marsh basin. Considering the large number of these diversions, a basinwide screen program, in a context of cooperation and partnership, is the most promising strategy for control of juvenile anadromous fish losses associated with their operation.

Since 1994, Interior has assisted the State of California in its efforts to minimize losses of anadromous fish at Central Valley diversions on the Sacramento and San Joaquin Rivers and their tributaries, in the Delta, and in Suisun Marsh. To help accomplish that goal, technical and policy teams were established to evaluate screening proposals and other loss-minimizing methodologies.

Participation by water diverters in the program is voluntary. Proposals are evaluated using established criteria, and those rated the highest are selected.

To date, 19 grants for feasibility and/or construction of fish screen projects in the Central Valley have been executed. Construction was initiated on 16 of these, 10 of which have been completed.

A program description was prepared to address the program organization, project eligibility, funding, project application process, guidelines for prioritization, screen construction criteria, and assurances relative to the Federal Endangered Species Act.

**REPORTS PREPARED FOR SECTION 3406(b)(21)**

- Draft Program Description
- Draft evaluation, monitoring, and maintenance plan
- Draft Anadromous Fish Screen Program environmental compliance guidelines

| Watershed | Project Name | Structures | Estimated Total Cost | Estimated Federal Cost | Status |
|---|---|---|---|---|---|
| American River | City of Sacramento, Fairbairn Site | 1Sc* | Unknown | $225,000* | Feasibility assessment |
| Butte Creek | Gorrill Land Company | 1Sc/1Ld | $1,551,897 | $756,000 | Under construction |
| Butte Creek | Rancho Esquon Partners | 1Sc/1Ld | $1,090,000 | $545,000 | Under construction |
| Butte Creek | Western Canal Water District<br>C Western Canal Siphon Construction<br>C Remove Two Western Canal WD Dams<br>C Remove McGowan Dam<br>C Remove McPherrin Dam<br>C Eliminate 12 Unscreened Diversions | 1 Siphon | $9,460,000 | $3,023,000 | Completed 1997 |
| Sacramento River | City of Sacramento, Water Treatment Site | 1Sc* | Unknown | $225,000* | Feasibility assessment |
| Sacramento River | Maxwell Irrigation District | 1Sc | $1,545,000 | $709,000 | Completed 1994 |
| Sacramento River | Natomas Mutual Water Company | Unknown | Unknown | Unknown | Feasibility assessment |
| Sacramento River | Parrot-Phelan Irrigation District/M&T Ranch | 1Sc | $4,585,000 | $2,284,000 | Completed 1997 |
| Sacramento River | Pelger Mutual Water Company | 1Sc | $278,000 | $139,000 | Completed 1994 |
| Sacramento River | Princeton-Cordora-Glenn/Provident ID | 1Sc | $10,958,000 | $5,350,000 | Under construction |
| Sacramento River | Reclamation District 108 | 1Sc | $12,051,000 | $6,001,000 | Under construction |
| Sacramento River | Reclamation District 1004 | 1Sc | $7,250,000 | $1,535,000 | Under construction |
| Sacramento River | Wilson Ranch | 1Sc | $231,000 | $90,000 | Completed 1995 |
| Yuba River | Brown's Valley Irrigation District | 1Sc | $364,000 | $115,000 | Under construction |
| Bay/Delta | Suisun Resource Conservation District | 5Sc | $900,000 | $450,000 | Completed 1997 |
| San Joaquin River | Banta-Carbona irrigation District | 1Sc | $5,692,000 | $2,712,000 | Final Design |
| | Total | 17Sc/2Ld/ 1 Siphon | $55,955,897 | $23,934,000 | |

Notes:
* Counted as same project
sc screen sites
ld ladder

# APPENDIX E

# Refuges and Waterfowl

# Appendix E Refuges and Waterfowl

# Supplemental Water Acquisition Program (Refuge Focus)

Reference Section of CVPIA: 3406(b)(3) & (d)(2) Start Date: 1993 Status: Ongoing

### Objective

- Acquire incremental Level 4 refuge water supplies

### Accomplishments

- Acquired 233,133 acre-feet of temporary water supplies to meet the annual Level 4 refuge water supply obligations
- Acquired 6,300 acre-feet of water as the first permanent supply to help meet Level 4 requirements

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $0 |
| 1994 | $2,348,303 |
| 1995 | $4,640,070 |
| 1996 | $1,785,939 |
| 1997 | $12,682,750 |
| 1998 | $6,201,456 |

Section 3406(b)(3) states, "The Secretary...is authorized and directed to develop and implement a program in coordination and in conformance with the plan required under paragraph (1) of this subsection for the acquisition of a water supply to supplement the quantity of water dedicated to fish and wildlife purposes under paragraph (2) of this subsection and to fulfill the Secretary's obligations under paragraph 3406(d)(2) of this title. The program should identify how the Secretary intends to utilize, in particular the following options: improvements in or modifications of the operations of the project; water banking; conservation; transfers; conjunctive use; and temporary and permanent land fallowing, including purchase, lease, and option of water, water rights, and associated agricultural land."

Interior has focused its efforts to acquire water in those areas offering opportunities to meet the most urgent fish and wildlife water needs. Supplemental water acquisitions focusing on Level 4 refuge water supply requirements. Averaged nearly 40,000 acre-feet per year from 1993 through 1998.

Section 3406(d)(2) directs the Secretary to acquire Level 4 refuge water supplies at increments of not less than 10 percent per year. Total Level 4 incremental water supplies are estimated to be 163,259 acre-feet. Interior has acquired temporary water supplies each year to meet the annual Level 4 requirements. Level 4 water supplies provide critical wetland wintering habitat and increased production of waterfowl food plants for migratory waterfowl of the Pacific flyway, threatened and endangered species (giant garter snake and Aleutian Canada goose), shore birds to the Pacific flyway, and resident wetland-dependent wildlife resources.

In early 1998, Interior acquired its first permanent water supply of 6,300 acre-feet from the Corning, Proberta, and Thomes Creek Water Districts. The districts sold this supply (from the Central Valley Project) at a one-time fee of $700 per acre-foot. This CVP water is now available to help meet the Level 4 refuge water supply requirements for CVPIA wetlands located within the Sacramento Valley.

## WATER ACQUIRED FOR LEVEL 4 REFUGE WATER SUPPLIES (acre-feet)

| Location of Wetlands | Willing Seller | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|
| **Sacramento River Basin** | | | | | | | |
| West Sacramento Valley | Corning, Proberta, and Thomes Creek Water Districts | 0 | 0 | 0 | 0 | 0 | 6,300 |
| East Sacramento Valley | Corning, Proberta, and Thomes Creek Water Districts | 0 | 0 | 0 | 0 | 4,000 | 0 |
| East Sacramento Valley | California Department of Fish and Game | 0 | 15,856 | 0 | 0 | 0 | 0 |
| **San Joaquin River Basin** | | | | | | | |
| N. San Joaquin Valley | Sacramento River Water Rights Settlement Contractors | 0 | 0 | 52,380 | 0 | 0 | 0 |
| N. San Joaquin Valley | Yuba Co. Water Agency | 0 | 0 | 0 | 0 | 25,000 | 0 |
| N. San Joaquin Valley | San Joaquin River Exchange Contractors | 15,000 | 12,000 | 25,000 | 30,348 | 40,000 | 0 |
| S. San Joaquin Valley | Semitropic Water Storage District | 0 | 5,200 | 6,802 | 0 | 0 | 0 |
| S. San Joaquin Valley | Delta-Mendota Canal Water Authority Users | 1,547 | 0 | 0 | 0 | 0 | 0 |
| | **TOTAL** | 16,547 | 33,056 | 84,182 | 30,348 | 69,000 | 6,300 |

**REPORTS PREPARED FOR SECTION 3406(b)(3)**

- EA and FONSI for Interim Water Acquisition Program, 1995
- EA's for various water acquisitions

# Agricultural Waterfowl Incentives Program

Reference Section of CVPIA: 3406(b)(22) Start Date: 1995 Status: Ongoing

## Objectives

- Create and maintain waterfowl habitat by providing incentives to flood agricultural fields during appropriate time periods
- Enhance migratory bird resources of the Pacific flyway
- Help protect, enhance, and recover threatened and endangered species
- Enhance CVP water supplies

## Accomplishments

- Finalized interim guidelines and completed NEPA requirements
- Created 22,314 acres of waterfowl habitat during winter 1997-98, resulting in use by 40,000 ducks and geese and tens of millions of bird-use days
- Targeted creation of 41,055 acres of waterfowl habitat during winter 1998-99

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1995 | $17,027 |
| 1996 | $33,373 |
| 1997 | $1,068,553 |
| 1998 | $933,184 |

Section 3406(b)(22) states, "The Secretary... is authorized and directed to...provide such incentives as...to encourage farmers to participate in a program, which the Secretary shall develop, under which such farmers will keep fields flooded during appropriate time periods for the purposes of waterfowl habitat creation and maintenance and for Central Valley Project yield enhancement..." The incentives are not to exceed $2 million each year, either directly or through credits against other CVP contractual payment obligations, including tiered pricing waivers. This program is scheduled to terminate on December 31, 2001, in accordance with its CVPIA authorization.

The Agricultural Waterfowl Incentives Program focuses on providing environmental benefits for waterfowl and wetland-dependent migratory birds by encouraging seasonal flooding of agricultural fields to create additional waterfowl habitat. Planning for the program began in 1995. The Service, working with Reclamation and the Central Valley Habitat Joint Venture, developed Draft Interim Guidelines for the program, which were provided to over 2,500 interested parties for review and comment. NEPA documentation was completed in 1996 and the Interim Guidelines were finalized.

**Program Benefits**

- Encourages a wider distribution of waterfowl populations
- Decreases potential for avian disease
- Increases available waterfowl food resources
- Potentially increases available water supplies

During the winter of 1997-98, 41 farmers participated in the program. Through cooperative agreements, these farmers created 22,314 acres of habitat for wintering migratory waterfowl and enhancement of CVP water supplies. The flooded fields were predominantly post-harvest rice fields in the Sacramento Valley, with one participant each in the Delta (corn) and San Joaquin Valley (wheat). Winter flooding of rice provides both an excellent supplement to existing local wetland habitat and a mechanism to decompose remaining rice straw that must be removed prior to planting the following spring.

Monitoring showed that as many as 40,000 ducks or geese used these newly flooded fields, resulting in tens of millions of bird-use days over the course of the winter. Herons, egrets, cranes, ibis, and several species of shore birds also used these new seasonal wetlands, adding to the increased species diversity of the areas.

Program participation for winter 1998-99 has increased substantially, both in the number of farmers Wildlife participating and in the acreage to be flooded. A total of 41,055 acres are scheduled to be flooded, almost double the acreage flooded in 1997-98.

**REPORT PREPARED FOR SECTION 3406(b)(22)**

C Agricultural Waterfowl Incentives Program Accomplishments Report, FY

# Refuge Water Supply and Conveyance

Reference Section of CVPIA: 3406(d)(1,3-5) Start Date: 1993 Status: Ongoing

### Objectives

- Assure firm reliable water supplies of suitable quality
- Implement construction of required conveyance facilities
- Negotiate and execute long-term water conveyance and service agreements

### Accomplishments

- Provided Level 2 water supplies as scheduled by wetland managers, 1993-98
- Acquired 233,133 acre-feet of interim Level 4 water supplies and 6,300 acre-feet of long-term Level 4 water supplies, as part of the Supplemental Water Acquisition Program [Section 3406(b)(3)]
- Executed six interim refuge water "wheeling" agreements to deliver up to 395,300 acre-feet of Level 2 & 4 water
- Completed agreement on refuge conveyance cost-share and construction responsibilities with Glenn-Colusa Irrigation District
- Completed Refuge Water Supply planning, decision, and implementation documents
- Initiated construction on five conveyance facilities, completing three

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $0 |
| 1994 | $2,438,922 |
| 1995 | $2,079,880 |
| 1996 | $4,295,075 |
| 1997 | $10,822,006 |
| 1998 | $14,053,219 |

Section 3406(d) states, "...The Secretary shall provide...firm water supplies of suitable quality to maintain and improve wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California; on the Gray Lodge, Los Banos, Volta, North Grasslands, and Mendota state wildlife management areas; and on the Grasslands Resources Conservation District in the Central Valley of California...[T]he quantity and delivery schedules of water measured at the boundaries of each wetland habitat area...shall be in accordance with Level 2 of the "Dependable Water Supply Needs"...as set forth in the Refuge Water Supply Report and two-thirds of the water supply needed for full habitat development for those habitat areas identified in the San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan Report prepared by the Bureau of Reclamation...The Secretary is authorized and directed to construct or to acquire from non-Federal entities such water conveyance facilities, conveyance capacity, and wells as are necessary to implement the requirements of this subsection..."

The Central Valley refuges were grouped into five study areas (see table on next page). Level 2 and Level 4 water supplies for the refuges were described in the Refuge Water Supply Investigations Report prepared by Reclamation in 1989. Level 2 supplies provide assurance that refuges will receive existing supplies in many areas and additional supplies in others. Level 4 supplies, estimated to be 163,259 acre-feet annually above Level 2 supplies, will allow these refuges to reach their full potential.

Starting in 1993, except where limited by conveyance restriction or ability to use additional water supplies, Central Valley refuges identified in the CVPIA received a full Level 2 water supply. In 1994, a NEPA/CEQA document evaluating the impact of delivering Level 2 supplies for the year was completed. On most refuges, delivery of Level 2 provides a much more "firm" supply, enabling managers to manage refuges differently and in a manner more responsive to the needs of dependent fish and wildlife.

The interim program to provide Level 4 water supplies to Central Valley refuges has purchased 233,133 acre-feet of water to date (1993-98): 19,856 acre-feet for east Sacramento Valley refuges, 199,728 acre-feet for refuges in the Grasslands/SJBAP lands area; and 13,549 acre-feet for southern San Joaquin Valley refuges. In 1998, the first long-term purchase was made, providing 6,300 acre-feet of long-term Level 4 water supplies to west Sacramento Valley refuges. To assist conveyance of all supplies, six interim water "wheeling" agreements were signed, allowing for conveyance of up to 395,300 acre-feet of Level 2 and 4 supplies in non-federally managed facilities. To accomplish full Level 2 and 4 deliveries, it was, and in many cases remains, necessary to improve or construct conveyance facilities as authorized under Section 3406(d)(5). From 1993 through 1998, Interior prepared five NEPA documents analyzing the impacts of constructing conveyance facilities and delivering water to refuges.

| Central Valley Refuge Study Areas | | | | |
|---|---|---|---|---|
| **Sacramento Valley** | | **San Joaquin Valley** | | |
| West Sacramento Valley<br>Sacramento National Wildlife Refuge (NWR)<br>Delevan NWR<br>Colusa NWR | East Sacramento Valley<br>Gray Lodge Wildlife Management Area (WMA)<br>Sutter NWR | Grasslands/SJBAP Lands<br>Kesterson NWR<br>San Luis NWR<br>Merced NWR<br>Volta WMA<br>Grasslands Resource Conservation District (RCD)<br>Los Banos WMA<br>Frietas Unit, San Joaquin Basin Action Plan Lands (SJBAPL)<br>West Bear Creek Unit, SJBAPL<br>Blue Goose Unit, SJBAPL | Mendota WMA/ Central San Joaquin Valley<br>Mendota WMA | South San Joaquin Valley<br>Pixley NWR<br>Kern NWR |

Construction began on five conveyance facilities, of which three were completed: the Island "C" Canal, providing supplies to the Federal West Bear Creek (West Gallo Unit) of the SJBAP lands; the Newman Canal and "J" Lateral effort, providing conveyance to the State China Island Unit; and a well and associated facilities at Pixley National Wildlife Refuge. Construction started on both the Stony Creek Siphon, a feature critical for providing Sacramento NWR Complex water supplies using Glenn-Colusa Irrigation District (GCID) facilities; and the China Island Unit "J" pumping plant and pipeline. Additionally, in 1998, a cooperative agreement was reached between Interior and GCID delineating refuge conveyance cost-share and construction responsibilities which will enable expansion of future deliveries to west Sacramento Valley refuges.

Provision of additional and/or more "firm" water supplies to Central Valley refuges has allowed managers to respond better to the needs of wetland-dependent species. Refuges receiving CVPIA water supplies experienced an approximate 12,000-acre valley-wide increase in average annual wetland acreage when compared to pre-CVPIA conditions. Permanent and seasonal wetlands have both benefited, allowing for an increase in permanent wetlands, an increase in the ability to more intensively manage moist soil vegetation, an increase in summer water areas, and providing for earlier flooding of seasonal wetlands to maximize habitat for early fall migrant waterfowl. As an example, the Grasslands RCD was able to increase acreage of enhanced seed production on an annual basis from 4,000 to 40,000 acres.

Responding to more favorable conditions, valley waterfowl populations seem to have increased accordingly. However, because wetland acreage is only a portion of the overall environmental requirements of Central Valley waterfowl, it is important to remember that factors beyond the CVPIA have no doubt played a part in the increase. The Grasslands RCD has seen waterfowl use in the early fall increase by 300 percent, while other areas have recorded increased use of 800 percent, from 2 million to over 18 million use days. Although not necessarily indicative of overall waterfowl trends, winter migratory waterfowl numbers have increased by as much as 100 percent on some refuges (Grasslands RCD) receiving CVPIA water supplies. At the same time, waterfowl disease-related mortality appears to be on the decline and is believed to be the result of increased wetland acreage providing healthier waterfowl which are more appropriately dispersed.

Refuges receiving CVPIA water supplies have experienced a significant increase in public use opportunities. The Sacramento NWR Complex was able to enhance habitat associated with tour routes and walking trails, experiencing a 61 percent increase in visitor use. Many Central Valley refuges were able to expand hunting opportunities, including opening new hunting areas and expanding hunting quotas. Responding favorably, the public has increased overall refuge visitation. As an example, the Salt Slough Unit of the North Grasslands WMA has had a ten-fold increase in hunter use.

Special status fish and wildlife species have also benefited from new opportunities for Central

Valley wetland management brought on by application of additional water provided under the CVPIA. Sacramento Valley refuges report increased use by western pond turtles and colonial nesting birds like the tri-colored blackbird. San Joaquin Valley refuges noted increased populations of giant garter snake and in the nesting of western, Clark's, and eared grebe; black-crowned herons; redhead and ruddy ducks; and tri-colored blackbirds. The Grasslands RCD noted an increase in two large roosting flocks of white-faced ibis. Valley-wide, shore-bird use on shallow wetlands has increased to hundreds of thousands as sandpipers, dunlins, yellowlegs, phalarope, and dowitchers respond to increased wetland acreage during fall and spring migrations.

**REPORTS PREPARED FOR SECTION 3406(d)(1,3-5)**

- NEPA documentation for Level 2 Refuge Water Supply Delivery, 1994
- Report of Recommended Alternatives, Refuge Water Supply and SJBAP Lands, 1995
- Refuge Water Supply Conveyance Alternatives Refinement Memorandum, 1995
- Refuge Water Supply Implementation Plan, 1996
- Draft NEPA documentation for Conveyance of Refuge Water Supply, South San Joaquin Valley Refuges, 1996
- Draft NEPA documentation for Conveyance of Refuge Water Supply, Mendota WMA, 1996
- NEPA documentation for Conveyance of Refuge Water Supply, West Sacramento Valley Refuges, 1997
- NEPA documentation for Conveyance of Refuge Water Supply, East Sacramento Valley Refuges, 1998
- NEPA documentation for Conveyance of Refuge Water Supply, Grasslands/SJBAP Refuges, 1998
- Administrative Proposal on Refuge Water Supply, 1998
- Final Implementation Plan, SJBAP Preferred Alternative, 1998
- Refuge Water Supply Implementation Plan, 1998
- China Island Implementation Plan, 1998

# APPENDIX F

# Other Fish and Wildlife

# Appendix F Other Fish and Wildlife

# Habitat Restoration Program

Reference Section of CVPIA: 3406(b)(1)"other" Start Date: 1996 Status: Ongoing

### Objectives

- Protect and restore native habitats
- Stabilize and improve populations of native species
- Restore a continuous riparian corridor along the San Joaquin River from Friant Dam to the Merced River

### Accomplishments

- Obtained partner contributions of approximately $48 million (match of 4.8 partner:1 Federal)
- Participated in the acquisition of 17,350 acres focusing on protection and restoration of native habitats
- Participated in acquisition of 60,784 acres focusing on stabilization and improvement in populations of native species
- Conducted biological surveys on federally listed species
- Contributed to development of a breeding program for riparian brush rabbit
- Assisted in development of watershed planning
- Initiated a habitat trend analysis study for the Central Valley
- Developed a riparian model for the Sacramento River
- Completed analyses of historic biological conditions and physical process for the San Joaquin River from Friant Dam to the Merced River

Section 3406(b)(1) states, "...in the course of developing and implementing this program the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the Central Valley Project not specifically enumerated in this section."

Two restoration programs were established in response to Section 3406(b)(1).

The first program, termed the Habitat Restoration Program, addresses the needs of native fish and wildlife affected by the CVP and not specifically addressed in other portions of Section 3406. The program has focused on:

- Habitats affected by construction and operation activities of the CVP and experiencing the greatest declines
- Special status species that are federally listed, proposed, or candidate for listing
- Non-listed State and Federal species of special concern
- Other associated native wildlife species within the above habitats

Projects and studies meeting program objectives were identified during other efforts, including the Endangered Species Act, section 7 consultations for interim CVP contract renewals, short- and long-term conservation programs being developed as a result of the Friant contract renewal consultation and CVP long-term contract renewals, PEIS, and implementation of other CVPIA activities.

Program projects concentrated on the identification, protection, and restoration of native habitats and species in the Central Valley, and program studies focused on the identification and evaluation of potential restoration opportunities.

The second program, the San Joaquin River Riparian Habitat Restoration Program, was developed to address the fact that the quantity and quality of riparian habitat along the San Joaquin River is inadequate to support production and survival of desirable plant and animal species. Working with the public, interested stakeholders, and agency staff, the program is pursuing a mutually acceptable riparian restoration effort on the San Joaquin River from Friant Dam to the confluence with the Merced River.

Initial efforts have been directed toward developing a sound scientific basis for identifying sites where restoration has a likelihood of success. Analyses of historic biological conditions and physical processes have been completed. Additional scientific data are being gathered in conjunction with efforts by the Corps of Engineers and DWR.

## Accomplishments

- Initiated planning for a continuous riparian corridor on the San Joaquin River between Firebaugh and Mendota Pool

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1996 | $1,643,236 |
| 1997 | $5,668,182 |
| 1998 | $2,104,716 |

**NATIVE HABITAT FOCUS PROJECTS**

| Project | Acres | Benefit |
|---|---|---|
| Participated in Valensin Ranch acquisition on the Cosumnes River | 4,300 | Protects grasslands, hardwood woodlands, riparian, and vernal pool habitats to benefit listed species including giant garter snake, bald eagle, Swainson's hawk, and tri-colored blackbird. |
| Participated in Howard Ranch acquisition on the Cosumnes River | 13,000 | Protects existing vernal pool, grassland, and valley oak hardwood habitats to benefit listed species, including federally listed vernal pool species. |
| Participated in Allensworth Ecological Reserve acquisition, Tulare County | 50 | Protects vernal pool and alkali sink habitats to benefit, federally listed vernal pool species and San Joaquin kit fox. |
| Total | 17,350 | |

**NATIVE SPECIES FOCUS PROJECTS**

| Project | Acres | Benefit |
|---|---|---|
| Participated in Pine Hills Ecological Reserve protection in El Dorado County | 189 | Contributes to survival and recovery of five listed plant species associated with gabbro soil formations in western El Dorado County. |
| Participated in North Weber Creek acquisition in El Dorado County | 54 | Protects habitat for one of two known populations of California red-legged frog, a federally listed species. |
| Participated in Springtown Alkali Sink acquisition, Alameda County | 85 | Provides protection of critical habitat for palmate-bracted birds-beak, a federally listed species. |
| Participated in the Simon Newman and Romero Ranches acquisition, western Merced County | 60,030 | Provides protection of habitat for listed species including San Joaquin kit fox and California red-legged frog as well as several other sensitive and native wildlife species. |
| Participated in the Caswell State Park restoration | 258* | Protects, enhances, and restores habitat for riparian brush rabbit and riparian woodrat. |
| Participated in Jensen Ranch acquisition on the San Joaquin River | 168 | Restores riparian habitat along San Joaquin River. Associated wildlife includes federally listed valley elderberry longhorn beetle. |
| Participated in the Alkali Sink Ecological Reserve Fencing | -- | Provides protection for Fresno kangaroo rat. |
| Contributed to development of captive breeding program for the riparian brush rabbit | -- | Will help stabilize and restore populations of riparian brush rabbit in the Central Valley. |
| Assisted development of watershed planning efforts | -- | Will help protect and restore riparian corridors which support a diversity of native wildlife species |
| Total | 60,784 | |

*Enhancement, not acquisition.

**HABITAT RESTORATION PROGRAM STUDIES AND MANAGEMENT PROGRAMS**

| Study/Program | Benefit |
|---|---|
| Conducted biological surveys for federally listed species | Provides additional life history and population information for listed species in the Central Valley, including California red-legged frog and giant garter snake. |
| Developed restoration and/or management programs | Provides benefits for large-flowered fiddleneck, giant garter snake, riparian brush rabbit, and riparian woodrat. |
| Initiated a habitat trend analysis study for the Central Valley | Assists in development of restoration goals for priority habitat in the Central Valley. |
| Developed a riparian model for the Sacramento River | Assists prioritization and location of riparian parcels for acquisition and/or restoration. |

**SAN JOAQUIN RIVER RIPARIAN HABITAT RESTORATION STUDIES**

| Studies | Benefit |
|---|---|
| Biological conditions analysis | Provides baseline for restoration effort evaluation and prioritization. |
| Physical conditions analysis | Provides baseline for restoration effort evaluation and prioritization. |
| Creation of a Geographical Information System | Allows joining geo-referenced results of data from other programs and outside analytical efforts. |
| Bathymetric studies | Provides data for modeling various flow regimes. |
| Development of a landowner database/GIS layer | Provides avenue to contact parties that may be affected by proposed site-specific projects. |
| Aerial and digital orthophotography | Provides baseline for restoration effort evaluation and prioritization. |
| Draft conceptual plan for 12 miles between Firebaugh and Mendota | Establishes stakeholder interest in developing a river parkway and protected area |

# Land Retirement Program

Reference Section of CVPIA: 3408(h) Start Date: 1994 Status: Ongoing

### Objectives

- Decrease drainage-related water quality problems in the San Joaquin Valley
- Enhance wildlife habitat and contribute to the recovery of endangered species
- Restore and protect aquatic habitat in the San Joaquin River through improved water quality
- Evaluate habitat rehabilitation techniques and land management options
- Acquire associated water rights for beneficial uses under CVPIA

### Accomplishments

- Acquired 1,228 acres of existing and potential fish and wildlife habitat at Prospect Island
- Initiated extensive public involvement and information program
- Created program parcel selection criteria
- Completed NEPA compliance and initiated 1,891-acre demonstration project
- Completed a groundwater model of the Panoche Fan
- Acquired 591 acres of agricultural land in 1996 and 995 acres in 1998

Section 3408(h) states, "The Secretary is authorized to purchase from willing sellers land and associated water rights and other property interests...which receives Central Valley Project water under a contract executed with the United States, and to target such purchases to areas deemed most beneficial to the overall purchase program, including the purposes of this title." The Secretary is authorized to purchase agricultural land which, in the opinion of the Secretary, would, "if permanently retired from irrigation, improve water conservation by the district, or improve the quality of an irrigation district's agricultural wastewater and assist the district in implementing provisions of a water conservation plan...; or are no longer suitable for sustained agricultural production...."

The Land Retirement Program is based, in part, upon recommendations of the San Joaquin Valley Drainage Program. In consideration of the similar objectives of both Federal and State statutes, the Land Retirement Program is a joint Federal-State program. The program's two principal objectives are to decrease drainage problems in the San Joaquin Valley and to enhance wildlife habitat and the recovery of endangered species. The potential to retire large blocks of land from willing sellers best meets these objectives.

**Benefits of Land Retirement**

- Improved water conservation
- Improved quality of irrigation wastewater
- Potential source of water for Water Acquisition Program
- Potentially enhanced recovery of wildlife resources, including endangered species

Currently, retirement of land is accomplished under Interim Guidelines and existing Federal regulations. The program, stressing adaptive management, is considered a pilot, or demonstration, program. After the 3- to 5-year demonstration program is complete, accumulated information will be used to conduct an ecological risk assessment and complete a programmatic NEPA document. The interim program is based on a competitive process, designed to retain maximum flexibility to the government in selecting and retiring lands.

In 1995, Prospect Island was acquired for nearly $2.9 million. The island, in the northwest Sacramento-San Joaquin Delta, contains 1,228 acres of existing and potential wildlife and fisheries habitats.

The Land Retirement Program established an interagency team and issued Interim Guidelines in 1996. Also in 1996, Interior purchased 591 acres of agricultural land in the Westlands Water District, on which DFG began a testing program to evaluate habitat restoration techniques using interim program guidelines and Federal regulations.

### Accomplishments

- Initiated NEPA compliance for expanded demonstration project
- Started feasibility study for Panoche-Silver Creek Corridor Project

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $50,497 |
| 1995 | $2,885,152 |
| 1996 | $1,368,250 |
| 1997 | $3,206,868 |
| 1998 | $2,429,889 |

Active public involvement began with public meetings and the publishing of notices in local newspapers in 1997. A Memorandum of Understanding was developed among Federal and State agencies outlining a shared vision and solidifying support for the Land Retirement Program. The Interim Guidelines were revised in November 1997, based on insight gained during the first year. Generalized parcel selection criteria addressing drainage, fish and wildlife enhancement, and the acquisition of water for other purposes of the CVPIA were developed, and a total of 12,563 acres were specified for retirement in the first round. Also, in 1997, a 1,891-acre demonstration program was established to monitor groundwater, soils, and biota; to determine effective habitat rehabilitation methods; and to demonstrate alternatives for the disposition of water.

In 1998, Interior expanded the demonstration program to 15,000 acres in an effort to determine if current selection criteria were adequate to accomplish the program's mission. NEPA documentation for the expanded demonstration program is nearing completion. A study was initiated to analyze the feasibility and cost of developing a riparian habitat and flood control corridor using retired lands in the vicinity of Panoche Creek. A groundwater model of the Panoche Fan, in the northwestern San Joaquin Valley, was completed by the University of California at Davis. Also in 1998, an agreement was signed by Interior and Westlands Water District providing land costs and uses for associated water within district boundaries. Using the agreement, the program purchased 995 acres as part of the demonstration project started in 1997.

**REPORTS PREPARED FOR SECTION 3408(h)**

- Interim Guidelines for Land Retirement, 1996 and 1997
- Demonstration Project Study Plan, 1998

# APPENDIX G

# Monitoring

# Appendix G Monitoring

# Comprehensive Assessment and Monitoring Program

Reference Section of CVPIA: 3406(b)(16) Start Date: 1994 Status: Ongoing

### Objectives

- Assess the overall effectiveness of CVPIA restoration actions within Section 3406(b)
- Assess the relative effectiveness of four CVPIA action categories: (1) water management modifications, (2) fish screens, (3) other structural actions, and (4) habitat restoration

### Accomplishments

- Developed Conceptual Plan
- Developed and initiated Implementation Plan
- Completed a riparian mapping program for the Sacramento River and tributaries
- Contracted with DFG to estimate adult American shad population and harvest of adult salmon and steelhead
- Implemented data management through the Interagency Ecological Program
- Completed two annual reports of the Comprehensive Assessment and Monitoring Program

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $0 |
| 1995 | $373,526 |
| 1996 | $1,867,315 |
| 1997 | $2,034,394 |
| 1998 | $1,617,838 |

Section 3406(b)(16) states, "The Secretary, is...authorized and directed to...establish, in cooperation with independent entities and the State of California, a comprehensive assessment program to monitor fish and wildlife resources in the Central Valley to assess the biological results and effectiveness of actions implemented pursuant to this subsection."

This program, the Comprehensive Assessment and Monitoring Program (CAMP), assessed four CVPIA action categories: (1) water management modifications, (2) fish screens, (3) other structural actions, and (4) habitat restoration efforts. The assessment will also be used to identify additional actions that may be required to meet the goals of the Act.

The Service evaluated existing fish monitoring programs in 1994. This assessment provided the baseline for development of a comprehensive program in 1995 and 1996 to evaluate the biological results and effectiveness of CVPIA actions.

CAMP was organized in two phases: (1) develop a Conceptual Plan for evaluating the overall success of various implemented actions (completed in 1995); and (2) develop an Implementation Plan to identify details of actual field work, data processing, and needed evaluations (completed in 1996).

During 1997, several contracts were developed with DFG in order to assess the effectiveness of CVPIA actions. These contracts included efforts to estimate American shad population, an angler survey to help estimate increases in adult salmon and steelhead populations, and screw trapping of juvenile chinook salmon on selected streams.

CAMP implemented a data management system through the Interagency Ecological Program, including the establishment of a CAMP Internet homepage, and is helping to coordinate monitoring plan development for CALFED. Additionally, the first annual report of the CAMP was prepared to provide review and analysis of program data collected from 1995 to 1997.

**REPORTS PREPARED FOR SECTION 3406(b)(16)**

- Comprehensive Assessment and Monitoring Plan - Conceptual Plan
- Comprehensive Assessment and Monitoring Plan - Implementation Plan
- Comprehensive Assessment and Monitoring Program - Annual Report 1995-1997 and Annual Report 1998

Interior provided matching funds to develop a sophisticated mapping program for the Sacramento River and tributaries. The purpose of the mapping program was to develop high-definition maps of riparian habitat. These maps provide baseline data and will assist in evaluating the success of restoration efforts.

# APPENDIX H

# Studies, Investigations and Modeling

# Eliminate Flow Fluctuation Losses

Reference Section of CVPIA: 3406(b)(9) Start Date: 1994 Status: Ongoing

### Objective

- Eliminate, to the extent possible, anadromous fish losses due to flow fluctuations caused by the operation of any CVP storage or re-regulating facility

### Accomplishments

- Coordinated management of CVP facilities to reduce flow fluctuations on the American and Stanislaus Rivers
- Worked toward developing reservoir release standards that minimize impacts on fisheries
- Initiated a study to determine threshold flows and ramping rates required to protect anadromous fish species on the American and Stanislaus Rivers

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $18,417 |
| 1995 | $55,552 |
| 1996 | $309,667 |
| 1997 | $144,364 |
| 1998 | $65,516 |

Section 3406(b)(9) states, "The Secretary... is...authorized and directed to...develop and implement a program to eliminate...losses of anadromous fish due to flow fluctuations caused by the operation of any Central Valley Project storage or re-regulating facility. The program shall be patterned where appropriate after the agreement between the California Department of Water Resources and the California Department of Fish and Game with respect to the operation of the California State Water Project Oroville Dam complex."

Beginning in 1994, technical staff from Reclamation, the Service, and DFG initiated preliminary work on criteria to reduce flow fluctuations.

In 1996, Interior contracted with DFG to conduct a 3-year study to determine threshold flows and ramping rates required to protect lower American River fishery resources. A multiagency American River Operations Work Group was formed to oversee the contract, develop interim criteria, and adaptively manage reservoir releases to benefit all project purposes including water supply and fish and wildlife management. The operations group has coordinated with stakeholders including water districts and municipalities, public safety organizations, recreational interests, and the environmental community to maintain the best habitat and water temperature conditions for anadromous fish consistent with water availability and reservoir storage. Aided by generally wet weather patterns, the group moderated potential flow fluctuations, provided cool water in spawning areas earlier than had been achieved in the past, and instituted a means of quickly responding in a coordinated fashion to changing meteorological conditions and management needs.

Work completed during the second year of the cooperative study included aerial and ground surveys, topographic surveys of areas sensitive to flow fluctuation, detailed evaluation of the relationships between water levels and the distribution and quality of salmon spawning and rearing habitat, and biological studies to define the effects of flow management on aquatic populations. A final report, including recommended operational criteria, is scheduled for completion in 1999. A similar effort on the Stanislaus River was initiated in 1998.

Evaluation of the effects of flow fluctuations on anadromous fish in all CVP-controlled streams is ongoing. Coordination and cooperation among agencies continue to identify new measures to eliminate losses of anadromous fish as study findings become available.

Other operations criteria to reduce flow fluctuations caused by CVP operations are addressed by the action in Section 3406(b)(2) regarding dedicated water.

# Shasta and Trinity Reservoir Carryover Storage Studies

Reference Section of CVPIA: 3406(b)(19) Start Date: 1998 Status: Ongoing

### Objective

- Protect and restore the anadromous fishes in the Sacramento and Trinity Rivers

### Accomplishments

- Evaluated Shasta Temperature Control Device operations
- Conducted temperature model studies of effects of the Shasta Temperature Control Device

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1998 | Funding under Section 3406(b)(9) |

Section 3406(b)(19) states, "The Secretary... is...authorized and directed to...reevaluate existing operational criteria in order to maintain minimum carryover storage at Sacramento and Trinity River reservoirs to protect and restore the anadromous fish of the Sacramento and Trinity Rivers...subject to the Secretary's responsibility to fulfill all project purposes, including agricultural water delivery."

Minimal planning under this CVPIA section is being done pending completion of the Anadromous Fish Restoration Plan (Section 3406[b][1]) and the Water Management Plan for the 800,000 acre-feet of CVP dedicated yield (Section 3406[b][2]). Related studies being conducted include evaluation of Shasta Temperature Control Device (TCD) and Trinity River operations.

Actions completed under this section include the evaluation of operational criteria to meet water temperature requirements and water supplies in response to changing project operations. Water temperature model studies, combined with the monitoring of actual operations, were used to evaluate the Shasta TCD operations and determine the most efficient use of cold-water resources for various water year types (for example, wet or normal). Results of this study will be incorporated into future studies on Shasta and Trinity Reservoir carryover storage.

In developing the Biological Opinion for winter-run chinook salmon, the National Marine Fisheries Service evaluated the operational criteria needed to maintain minimum carryover storage in Shasta Reservoir to protect the anadromous fish in the Sacramento River. The Biological Opinion specified that 1.9 million acre-feet should be the minimum carryover storage in Shasta for protection of the winter-run chinook salmon. Results from the Trinity Reservoir Carryover Study will be used in developing the final storage and operational criteria for the reservoir.

# San Joaquin River Comprehensive Plan

Reference Section of CVPIA: 3406(c)(1) Start Date: 1993 Status: Unfunded

### Objective

- Develop a comprehensive plan to restore fish, wildlife, and associated habitat along the San Joaquin River

### Accomplishments

- Outlined study parameters to address environmental and social needs
- Initiated data collection to establish study area baseline and potential conditions
- Completed several draft documents explaining study processes and interim results
- Conducted an extensive public outreach program to solicit comments on the plan

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $596,732 |
| 1994 | $624,968 |
| 1995 | $927,725 |
| 1996 | $2,638 |

Section 3406(c)(1) states, "The Secretary shall...develop a comprehensive plan which is reasonable, prudent, and feasible to address fish, wildlife, and habitat concerns on the San Joaquin River, including but not limited to the streamflow, channel, riparian habitat, and water quality improvements that would be needed to reestablish where necessary and to sustain naturally reproducing anadromous fisheries from Friant Dam to its confluence with the San Francisco Bay/Sacramento-San Joaquin Delta Estuary."

Development of a San Joaquin River comprehensive plan was initiated in 1993 and concluded in 1996. Work on the plan included development of study guidelines, establishment of an extensive public outreach program, data collection, and document preparation.

Study planning began in 1993 and these tasks were completed:

- Developed an outline of study parameters for anadromous fish re-establishment
- Defined six major emphasis areas for ecosystem improvement
- Listed potential alternative water supplies
- Developed draft goals and objectives for the plan
- Developed a draft "Purpose and Need for Action" statement, as required by NEPA

In addition, these data collection activities were initiated:

- Developed two aerial videos of the San Joaquin River and its bypass at various flow regimes
- Compiled "existing conditions" documents for baseline definition
- Conducted field studies to analyze river flows, losses, and travel times (completed)
- Conducted field studies to analyze water quality and the interface between groundwater and surface water

A comprehensive public outreach program was initiated in 1995 and included the presentation of draft scoping and public outreach plans at meetings within the Central Valley. Thousands of individuals attended these meetings, and Interior received hundreds of written comments from these meetings and from review of various draft reports. A majority of comments opposed continuation of the study based on concerns about impacts to the existing agri-social structure in areas adjacent to the San Joaquin River.

Because of public opposition to continued study, Congress did not approve funding for fiscal year 1996, and Interior terminated its work on the plan.

**REPORTS PREPARED FOR SECTION 3406(c)(1)**

- Draft Scoping Plan
- Draft Public Involvement Plan
- Instream Flow Incremental Methodology Report
- Draft Anadromous Fish Historical Conditions and Existing Conditions Report
- Draft Interim Report

# Stanislaus River Basin Water Needs

Reference Section of CVPIA: 3406(c)(2) Start Date: 1993 Status: Ongoing

### Objective

- Evaluate and determine existing and future basin needs in the Stanislaus River Basin

### Accomplishments

- Developed surface-water and groundwater models
- Conducted environmental modeling (HEP) for the Stanislaus River
- Developed alternatives
- Developed temperature model of the Calaveras River
- Prepared transition report that documented study activities
- Prepared a Stanislaus River Basin and Calaveras River Water Use Program, Threatened and Endangered Species Report

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1993 | $110,238 |
| 1994 | $294,809 |
| 1995 | $286,182 |
| 1996 | $24,485 |
| 1997 | $0 |
| 1998 | $0 |

Section 3406(c)(2) states, "The Secretary shall, by not later than September 30, 1996...evaluate and determine existing and anticipated future basin needs in the Stanislaus River Basin. In the course of such evaluation, the Secretary shall investigate alternative storage, release, and delivery regimes, including but not limited to conjunctive use operations, conservation strategies, exchange arrangements, and the use of base and channel maintenance flows, in order to best satisfy both basin and out-of-basin needs consistent, on a continuing basis, with the limitations and priorities established in the Act of October 23, 1962 (76 Stat. 173)..."

On March 26, 1993, Reclamation and DWR signed a Memorandum of Agreement describing each agency's role in the preparation of an Environmental Impact Statement/Environmental Impact Report for the Stanislaus River Basin and Calaveras River Water Use Program. Reclamation began development of a surface-water model for use in analyzing alternatives, and DWR began development of a groundwater model. The agencies also formulated several alternatives and completed operations studies (computer modeling) for the alternatives. Reclamation developed a temperature model of the Calaveras River from New Hogan Reservoir to the mouth of the Calaveras River.

The Service completed an initial terrestrial habitat model (Habitat Evaluation Procedure [HEP]) for the Stanislaus River riparian corridor from Goodwin Dam to the confluence of the San Joaquin River. A report was also prepared addressing potential impacts that implementation of the Stanislaus River Basin and Calaveras River Water Use Program might have on federally listed species.

In March 1995, DWR withdrew as a partner in the study after model studies indicated that no additional dependable water supply was available from the Stanislaus River. Reclamation was unable to identify another non-Federal cost sharing partner to continue the study. The results of the data collection and analysis were published in a transition report titled "American River/Folsom South Conjunctive Use Optimization Study," dated May 1996. This report includes information obtained from the American River Water Resources Investigation intended to meet the requirements under Section 3406(c)(2).

Additional study of the Stanislaus River Basin water needs was initiated in 1998 to assess the water temperature parameters and refine the analysis of the groundwater resources. Two water temperature profilers were purchased for installation in New Melones Reservoir and will collect data to quantify the cold water resource in the reservoir and help manage river temperatures for chinook salmon. Work was initiated to extend the groundwater model (San Joaquin County Integrated Groundwater Surface Water Model) to include the area between the Stanislaus River and the Tuolumne River. The

extended model will be used to analyze conjunctive use opportunities in the Stanislaus Basin. Additional evaluations include a study of the effects of flood-plain development, and the relationship between reservoir management and the ecological functioning of the river.

**REPORTS PREPARED FOR SECTION 3406(C)(2)**

- Transition Report, American River/Folsom South Conjunctive Use Optimization Study, 1996
- Stanislaus River Basin and Calaveras River Watershed Use Program, Threatened and Endangered Species Report,

# Central Valley Wetlands Water Supply Investigations

Reference Section of CVPIA: 3406(d)(6) Start Date: 1995 Status: Ongoing

### Objectives

- Identify alternatives for improving water supply quality and reliability to privately owned wetlands
- Determine potential water supply locations and delivery requirements for 120,000 acres of potentially restorable wetlands

### Accomplishments

- Developed an Interagency Management Team and prepared an administrative draft report
- Identified private wetlands locations and identified some water needs and reliable water supply alternatives
- Developed a GIS database and model to assist in identifying areas of potentially restorable wetlands and associated water supply and delivery requirements

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1995 | $750 |
| 1996 | $1,467,425 |
| 1997 | $488,749 |
| 1998 | $49,100 |

Section 3406(d)(6) states, “The Secretary, in consultation with the State of California, the Central Valley Habitat Joint Venture, and other interests, shall investigate and report on the following supplemental actions by not later than September 30, 1997: alternative means of improving the reliability and quality of water supplies currently available to privately owned wetlands in the Central Valley and the need, if any, for additional supplies; and water supply and delivery requirements necessary to permit full habitat development for water dependent wildlife on 120,000 acres supplemental to the existing wetland habitat acreage identified in Table 8 of the Central Valley Habitat Joint Venture's "Implementation Plan" dated April 19, 1990, as well as feasible means of meeting associated water supply requirements.”

Interior designated the Service to lead efforts associated with these investigations and reports. Working through the Central Valley Habitat Joint Venture, the Service formed an Interagency Management Team consisting of the Service, Reclamation, DFG, Ducks Unlimited, California Wildlife Conservation Board, California Waterfowl Association, and The Nature Conservancy. This team provided technical guidance.

Completed investigations reviewed water supply needs and quality requirements for private wetlands, identified means to meet those requirements, and assessed the reliability of identified supplies. The investigations also identified potential locations, delivery requirements, and water supplies for full development of 120,000 acres of wetlands supplemental to existing habitats.

Completion of the final report has been delayed due to difficulties in obtaining information and is expected to be completed in 2001. It will serve as a tool for Federal, State, and local government agencies, conservation organizations, water districts, and individual landowners interested in further investigation of wetland water needs and supplies on a site-specific basis.

# Investigation on Maintaining Temperatures for Anadromous Fish

Reference Section of CVPIA: 3406(e)(1) Start Date: 1994 Status: Ongoing

## Objective

- Investigate measures to control water temperature by controlling or relocating irrigation and sewage effluent return flows or restoring riparian forests

## Accomplishments

- Completed field investigations on the interaction between riparian forests and river water temperatures along Sacramento River
- Evaluated effects of vegetation, agricultural drainage, and sewage discharge on water temperatures

## Fiscal Data*

| Fiscal Year | Obligation |
|---|---|
| 1994 | $84 |
| 1995 | $31,465 |
| 1996 | $828,177 |
| 1997 | $985,197 |
| 1998 | $125,098 |

* Includes both 3406(e)(1) and 3406(e)(3 and 6)

Section 3406(e)(1) states, "Not later than 5 years after the date of enactment of the title, the Secretary shall investigate and provide recommendations to...[Congress]...on the feasibility, cost, and desirability of developing and implementing...measures to maintain suitable temperatures for anadromous fish survival in the Sacramento and San Joaquin rivers and their tributaries, and the Sacramento-San Joaquin Delta by controlling or relocating the discharge of irrigation return flows and sewage effluent, and by restoring riparian forests."

Salmon and steelhead in the Central Valley evolved in an environment obligating their survival to areas of cold, uncontaminated flowing waters connected to the sea. The temperatures of these streams have changed significantly as a result of modifications to meet society's needs, and some anadromous fish populations, such as winter-run chinook salmon, are near extinction. The potential benefits of improving instream temperatures in these natal streams include more appropriate instream spawning and rearing conditions, improved survival of adult anadromous fish during migration, and enhanced riparian habitat for feeding, predator avoidance, and resting.

Over the last 4 years, this investigation focused on the interaction between riparian forests and water temperature along the Sacramento River and evaluated the effects of vegetation, agricultural drainage, and sewage discharge on water temperatures in Central Valley rivers and tributaries. A report on the investigation is expected to be completed in 2000.

# Investigations on Tributary Enhancement

Reference Section of CVPIA: 3406(e)(3 and 6) Start Date: 1994 Status: Completed

### Objectives

- Investigate measures to eliminate barriers to fish passage in Central Valley rivers and tributaries
- Investigate methods to improve habitat on Central Valley tributary streams

### Accomplishment

- Completed CVPIA Tributary Production Enhancement Report

### Fiscal Data*

| Fiscal Year | Obligation |
|---|---|
| 1994 | $84 |
| 1995 | $31,465 |
| 1996 | $828,177 |
| 1997 | $985,197 |
| 1998 | $125,098 |

* Includes both 3406(e)(1) and 3406 (e)(3 and 6)

Section 3406(e)(3) states, "Not later than five years after the date of enactment of this title, the Secretary shall investigate and provide recommendations to...[Congress]...on the feasibility, cost, and desirability of developing and implementing measures to eliminate barriers to upstream and downstream migration of salmonids in the Central Valley, including but not limited to screening programs, barrier removal programs and programs for the construction or rehabilitation of fish ladders on tributary streams."

Section 3406(e)(6) state, "Not later than five years after the date of enactment of this title, the Secretary shall investigate and provide recommendations to...[Congress]...on the feasibility, cost, and desirability of developing and implementing other measures which the Secretary determines would protect, restore, and enhance natural production of salmon and steel-head trout in tributary streams of the Sacramento and San Joaquin Rivers, including but not limited to the Merced, Mokelumne, and Calaveras Rivers and Battle, Butte, Deer, Elder, Mill, and Thomes Creeks."

Both of these studies were conducted in coordination with the Anadromous Fish Restoration Program [3406(b)(1)] and investigated the potential benefits of removing anadromous fish barriers and constructing passage facilities. These studies evaluated opportunities for habitat improvement, flow augmentation, and riparian management on all Central Valley streams.

Actions suggested in these studies could increase fish habitat and the production of juvenile anadromous fish in important rivers and streams not regulated by the CVP. Additionally, wildlife species will benefit as riparian and other adjacent terrestrial habitats are included in restoration activities.

A report was completed in 1998 and will be submitted to Congress in 2000 along with the report for Section 3406(e)(1).

**REPORT PREPARED FOR SECTION 3406(e)(3 and 6)**

- CVPIA Tributary Production Enhancement Report

# Report on Fishery Impacts

Reference Section of CVPIA: 3406(f) Start Date: 1994 Status: Completed

### Objective

- Prepare a report detailing all effects of the CVP on anadromous fish

### Accomplishment

- Completed report in December 1995

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $5,374 |
| 1995 | $951,672 |
| 1996 | $513,921 |

Section 3406(f) states, "The Secretary, in consultation with the Secretary of Commerce, the State of California, appropriate Indian tribes, and other appropriate public and private entities, shall investigate and report on all effects of the Central Valley Project on anadromous fish populations and the fisheries, communities, tribes, businesses and other interests and entities that have now or in the past had significant economic, social or cultural association with those fishery resources. The Secretary shall provide such report to...[Congress]...not later than two years after the date of enactment of this title."

In October 1995, a draft report was prepared based on a review of numerous reports and file documents; public meetings; and meetings with appropriate entities such as sport and commercial anglers, business owners, and Indian tribe representatives. The report was finalized in December 1995 and describes the major impacts of CVP reservoir facilities and operations on anadromous fish.

**REPORT PREPARED FOR SECTION 3406(f)**

- Report on Fishery Impacts

# Ecological and Hydrologic Models

Reference Section of CVPIA: 3406(g) Start Date: 1994 Status: Ongoing

## Objectives

- Develop and improve scientific models to evaluate existing and alternative Central Valley water system operations and ecologic restoration efforts
- Ensure models are broadly available and readily usable

## Accomplishments

- Completed Phase I of the "Consensus Project"
- Participated in other ongoing modeling efforts
- Increased public awareness of availability and use of models
- Developed model data including collection of plunging flows information
- Initiated development of hydrologic and ecological models
- Developed specifications to design an integrated modeling environment
- Modified existing models to help plan and execute CVPIA water management provisions

## Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $569,985 |
| 1995 | $328,039 |
| 1996 | $1,293,680 |
| 1997 | $1,252,382 |
| 1998 | $1,379,263 |

Section 3406(g) states, "The Secretary, in cooperation with the State of California and other relevant interests and experts, shall develop readily usable and broadly available models and supporting data to evaluate the ecologic and hydrologic effects of existing and alternative operations of public and private water facilities and systems in the Sacramento, San Joaquin, and Trinity River watersheds."

The goal of the program is to develop an integrated modeling environment that enables interested parties to use both ecologic and hydrologic models to systematically evaluate the potential impacts of various CVP actions.

**Benefits of Improved Models**

- Better technical evaluation of actions proposed under CVPIA
- Better understanding of surface-water and ground-water impacts
- Assistance in setting priorities and adaptively managing implementation of CVPIA

To date, work efforts have focused on developing available model data and logic to improve hydrologic and ecological models. Efforts to create new models have been coordinated with the U.S. Geological Survey and DWR. Interior participated in many multiagency work groups, including the Bay-Delta Modeling Forum and San Joaquin River Technical Group, and has entered into cooperative agreements with other agencies and research organizations as a means of expanding and complementing its expertise. Efforts are under way to develop graphical user interfaces for various models to make them more accessible to a variety of users.

**Hydrologic Model Development in Progress**

- Surface-water reservoir operations:
  - Modified SIMYLD, Labadie, et al, Colorado State University (MODSIM)
  - California Simulation Model (CALSIM)
  - Ecologically Cogent Operations Simulation Model (ECOSIM-W)
- Groundwater management:
  - Update Central Valley Groundwater/Surface Water Model (CVGSM)
  - San Joaquin County Integrated Surface/Ground Water Model
  - Tulare Groundwater Model
- Variable time-step surface-water operations
- Three-dimensional temperature for Whiskeytown Reservoir

When the program was initiated in 1994, the National Heritage Institute was contracted to assist in the implementation of a "Consensus Project," designed to reach agreement on the selection of tools and methodologies required to answer questions raised in the CVPIA legislation. This effort has been further refined and implemented in the

current work plan. Because of this effort and others, Interior has been able to raise the level of awareness in the general public been able to and interested parties regarding modeling techniques and the benefits resulting from their use.

**Ecological Model Development in Progress**

- Sacramento River and tributaries chinook salmon life history
- Sacramento River meander processes
- Response of floodplains and riparian habitat to flow patterns
- Reservoir and stream temperatures for the Stanislaus River
- 3-D estuarine hydrodynamic and salt transport

**REPORTS PREPARED FOR SECTION 3406(g)**

- Consensus Project, Phase I
- Plunging Flows Study
- Integrated modeling environment design

# Project Yield Increase (Water Augmentation Program]

Reference Section of CVPIA: 3408(j) Start Date: 1994 Status: Completed

### Objective

- Develop a least-cost plan to increase the yield of the CVP by the amount dedicated by the CVPIA, and to assist the State of California in meeting future water needs

### Accomplishments

- Prepared a least-cost plan describing options for increasing CVP yield by evaluating supply increase and demand reduction opportunities
- Submitted plan to Congress in July 1996

### Fiscal Data

| Fiscal Year | Obligation |
|---|---|
| 1994 | $738,170 |
| 1995 | $991,446 |
| 1996 | $59,964 |
| 1997 | -$712 |

Section 3408(j) states, "In order to minimize adverse effects, if any, upon existing Central Valley Project water contractors resulting from the water dedicated to fish and wildlife under this title, and to assist the State of California in meeting its future water needs, the Secretary shall...develop and submit to the Congress, a least-cost plan to increase, within fifteen years after the date of enactment of this title, the yield of the Central Valley Project by the amount dedicated to fish and wildlife purposes under this title."

The Least-Cost CVP Yield Increase Plan was developed with consideration of all reasonable options, including supply increase and demand reduction. The perspectives and viewpoints of various individuals and agencies affected by the CVPIA were incorporated into the planning process. More than 100 yield increase options were identified and evaluated for annual cost, yield, environmental effects, social effects, implementation time, and associated institutional issues. Options that did not have known unacceptable environmental or social impacts, and could be implemented in the required timeframe (CVPIA requires the plan be implementable by 2007), were incorporated into the plan. The plan also addressed the effects of near-term competition for water in California, both for currently developed supplies and for future supply increases. These effects are increased water costs and loss of options to other developers or purchasers. Options evaluated in the plan had a cumulative yield of approximately 3 million acre-feet.

The marginal cost for implementing the first 800,000 acre-feet of yield increase was estimated to be $175 per acre-foot under 1995 market conditions. As competition increases and options are implemented by others, some options involving the purchase of water could reach $650 to $700 per acre-foot. These higher costs, affected by competitive forces, make non-purchase options such as conjunctive use relatively more attractive than others.

**Water Augmentation Program Options**

- Land Fallowing
- Conservation
- Modifications to CVP/SWP Operation
- Supplies from Local Water Projects
- Conjunctive Use
- Water Reuse
- Surface Storage and Conveyance
- Other Supply Options

The Least-Cost CVP Yield Increase Plan was submitted to Congress in 1996.

**REPORT PREPARED FOR SECTION 3408(j)**

- Least-Cost CVP Yield Increase Plan